



COAL AGE



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\$ Prosperity Plus \$

Shrewd observers in the coal trade report an unprecedented prosperity in all parts of the country, which is further proved in survey of the business structure.

THE optimistic predictions of one enthusiastic coal man that there will be a strong market for the next two years will be more nearly realized than most people are ready to believe at this time. The present boom is unique in that it has been achieved in the face of a world war and resulting conditions that are not permanent. The more conservative of American manufacturing interests have consistently refused to enthuse even when confronted with an unprecedented influx of orders; they have also refrained from speeding up their plants until the necessity for doing so could no longer be ignored.

The prediction of the optimistic coal man is strongly substantiated by the following comments from leading members of the coal trade:

George M. Dexter, New York—Quotations already rule well above the level prevailing at this time last year, and indications are that they will be 50c. higher by January 1.

J. K. Dering, Chicago—This is the best market we have known in 25 years.

National Coal and Coke Co., Birmingham—Most of the mines in this section are turning down new business.

Pickands, Brown & Co., Chicago—Our plants are taxed to their full capacity, and prices on both contract and spot coke are materially higher than a year ago.

Thorne, Neale & Co., Inc., Boston—Prices rule from 25 to 50c. higher than last year.

Quemahoning Coal Co., Baltimore—The outlook is for a continuous shortage of coal during the next two years.

William E. Marks Coal Co., Worcester, Mass.—Indications point to \$3 coal before Jan. 1.

J. W. Dykster & Co., Detroit—The coal business never was any better even during the strike of 1902.

Ajax-Hocking Coal Co., Baltimore—Even the current fictitiously high prices show indications of being exceeded.

William A. Jepson, Boston—The situation is extraordinary, and there is no telling how serious the outcome may be if we have bad weather.

The general industrial situation is the true index to the coal trade. Market conditions are sensitive to the slightest fluctuations in the business situation. A brief review of the economic structure shows:

Our export trade has attained to stupendous proportions. It is increasing at the rate of 50 per cent. per annum and shows no indication of diminution. In the first seven months of the current year we exported close to three billion dollars' worth of commodities, as compared with slightly less than two billion dollars' worth for the corresponding period of last year.

Banking interests view the unparalleled influx of gold as gratifying evidence of existing conditions. The present importations from Canada alone will aggregate \$400,000,000, representing approximately the output of the whole world for a year. At the present time our gold reserves aggregate more than the combined totals of any two of the belligerent nations.

Particular interest centers on the phenomenal expansion in the steel industry. During the last fiscal year this country exported close to ten million tons of iron in all

forms, valued at over one billion dollars. And the May and June statistics indicate a substantial increase over these figures. Exports during those months were at the rate of twelve million tons per annum, having a gross value of $1\frac{1}{2}$ billion dollars.

Earnings of the steel mills are of unprecedented proportions. One of the best informed financial bureaus in the country is authority for the statement that the United States Steel Corporation is now earning at the rate of \$67 per share on its common stock, or approximately 340 million dollars per annum.

Revenues from the operation of the country's railroad systems for the year ending June 30 present even more striking evidence of bountiful prosperity. As compared with last year, the current statements of the railroads show in the aggregate a gain of over three billion dollars, or approximately 40 per cent.

Ideas and Suggestions

Looking Ahead

By N. H. SEABURG*

Power inevitably begets arrogance. It is a natural failing of all mankind, varying only in degree. This is a fact that no one can seriously dispute. Previously to the European war, the status of the seller and the buyer of coal was what one may call normal; that is, the supply was generally a shade greater than the demand, sometimes more and sometimes less. This economic condition made the seller an eager bidder for any business that he could possibly handle in his territory. Competition was keen. He must shade his prices, guarantee certain deliveries and qualities, endure petty and fretful complaints, and often play the part of the underdog in many ways. The seller could not very well escape this position. It meant so much tonnage to him.

The buyer, on the other hand, realized his power and arrogantly used it. The seller was eager to wait on him. If the buyer was in the mood he condescended to see the seller. If not—well, a salesman can recall with great ease the many times he has been denied interviews. Rebuffs were numerous. At his finger tips, however, the buyer had a choice selection of bids from as many companies as he desired to quote him on his coal requirements. He had a comprehensive field to choose from. He was boss.

All this is changed now. The war has completely reversed the positions of buyer and seller. The seller is now the boss, dictating his own terms and conditions, receiving and interviewing the anxious and eager buyer as he once was received. He is expanding with his own importance. This is the way he has hundreds of times wished he had the buyer. He has played the underdog long enough. It tickles his vanity to have buyers supplicate him for coal at any price. It is with a delightful, albeit with a twinge of regret, taste in his mouth that he dictates, "We cannot quote you on your proposal, as our entire output at the present time is already contracted for."

And such is the status of the buyer and the seller in the coal trade today. It is only a temporary state, however, and the end of the war, with a short period of peace, will soon reestablish the normal status. It is the wise and prudent seller that looks ahead to this return of old conditions that is insuring himself against the folly of the misuse which certain sellers are making of their present power. There's many a seller, not foresighted enough because of the blinding power that the recent unnatural state of affairs has put into his hands, who is digging the grave of his business in the very near future. He does not realize the danger of usurping his power. He should remember that he will be judged in the future by his present deeds. The buyer is not going to forget or forgive his attitude now. He will remember it. Realizing this, the progressive and alert

seller is preparing for the future. Although it may be physically impossible for him to satisfy each and every customer, and to take on new business, yet he is careful not to antagonize them. Instead, he does whatever he can for them. He advises them of the most likely places they can get coal, the prevailing prices, the state of the marine market, and the fluctuating embargo situation, all of which questions he is in intimate touch with every day. It goes without saying that the worried and possibly befuddled buyer appreciates this interest on the part of the seller. Not only does he come to like the seller personally for helping him out of his difficulty, but he will become a staunch supporter of his cause in future transactions. A friend in need is a friend indeed.

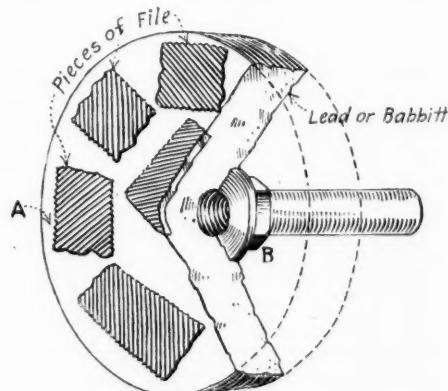
It may be all very well to make hay while the sun shines, yet it is very poor business to kill the goose that lays the golden eggs. Competition is too keen nowadays to permit hogging today when the time is propitious without thought of the morrow. It is a ruinous policy. The future will prove this conclusively.

The live coal dealer will therefore guard his future interests by assisting the distracted buyers as much as lies within his power. At the same time he will be helping to relieve in a great measure the strained and unnatural conditions prevalent throughout the entire business world just now. And it is only by such mutual assistance that any relief can be obtained.

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Facing Up Pump-Valve Seats

A handy and often extremely convenient pump-valve facing tool may be made from a piece of an old file. I would suggest a tool made somewhat differently, as shown herewith, which will give more satisfactory results, as it



TOOL FOR TRUING UP VALVE SEATS

has a larger bearing surface. The pieces of old file are cast into the babbitt-metal body and are so placed as to scrape the valve seat crosswise of the flutes in the file. Care should be taken that these pieces are not located with the flutes as at A, or they will groove the seat and it will be difficult to do a good job. The position of the files should be similar to that in drawfiling.

This tool is made by placing files on some plain metal surface, placing a ring or mold around all and pouring the babbitt into the mold so formed. On top and in the center place a nut, preferably a washer nut, as indicated at *B*, of such height that it will project above the mold so that a socket wrench may be used for rotating the tool. Or if desired, a threaded driver may be screwed into the nut and the valve-seat facer rotated with an air drill or an ordinary carpenter's bit brace. The metal must be backed away from the files slightly.

This valve-seat tool is frequently used by pump repair men.—R. E. Newcomb in *Power*.

“Capital Wanted”

BY CANADIAN ENGINEER

Mine managers, local storekeepers and others in a similar relative position in mining districts often branch out and become operators on their own account, and frequently the greatest obstacle to the progress of these small operators is to obtain the necessary capital with which to work their holdings. There may be small coal areas that are not large enough to attract larger companies; there may be more difficult areas or areas abandoned by a profligate company, or there may be coal much thinner than the large company with its excessive capital could afford to work. These and others the small operator takes hold of and develops. But recognizing the opportunity is easier than obtaining the capital to realize it.

The large financial concern advertises through the medium of a printed prospectus that capital is wanted for a certain enterprise. This circular reaches a number of investors more or less connected with the central financial house, and whose main guiding principle is to deal in stocks which are quoted or will be quoted in the course of time upon some of the various stock exchanges. To such men the offering of the small operator does not appeal. There is no general sale for any such stock except locally, and that in only a limited way. And even if it did appeal to investors of this type, the operator of the small mine has no way of reaching them—the cost of advertising his wants would for one thing be out of all proportion to the results that would accrue.

On the other hand there is a class of investors who are quite willing to take an interest in matters of this sort. These are men generally of the same class and standing as the operator himself, men who do not make their investments as if it were their entire business in life. They are men who like to take a personal interest in what is done with their money. Many go on the boards of the small companies and by their business knowledge and ability frequently act in some advisory capacity. There are thousands of such men who are willing to take a share and a chance to get returns.

Take my own case. I do not hold a share or bond of any of the supposedly sane and eminently respectable municipal enterprises. Instead I have all my life backed up the small enterprises that have from time to time come my way. As a result I hold some stock which yields me as high as 20 and 30 per cent., has done so for a number of years and will continue to do so in the future. I suppose that the banker and the financier will condemn my point of view as speculative, but I consider that my average return is a good deal better than a solid 4 per cent.

interest-bearing bond, and I get a great deal more fun and amusement for my money.

Obviously there are many like myself in this respect, since if it were not so there would be no small enterprises in the country—they would long ago have been gathered into the arms of the large corporations. The problem then remains of how to get the capital to the opportunity, considering the attendant circumstances.

Inevitably the mind comes round again to advertising, since that appears to be the only road on which the seller of an article is able to get in touch with the buyer. But while it is simple to consider this, it is an entirely different question when the theory is reduced to practice. Advertising for capital is unsatisfactory—except in the case of the large company already organized for such work—and the main reason for this appears to be the odor of past rank performance that still sticks to the procedure. The mere mention of advertising for capital is enough to forever discount the enterprise in the eyes of many people, owing to the vast flood of “fly-by-night” propositions that once swept the country. Consequently the first step toward any solution is the attainment, or the possession, of respectability and reliability.

But who is going to guarantee these characteristics? Obviously there are only two bodies or associations capable of giving the needed “hallmark,” and these are either the mining societies or the technical journal. To expect the first to do so would, I suppose, be equivalent to invoking a miracle, and so the journal appears to be the medium that not only is the most feasible but also the one which has the greatest interest in doing what is right. No journal could profess to inspect and approve every enterprise that might be submitted to the mining public through its pages, and therefore it would have to give its approval to a number of organizations formed to do this work and which it could reasonably guarantee as being of the necessary reliability and respectability.

No doubt there is nothing original in this proposal or suggestion, there have been so many variations in the methods pursued to get capital for both good and worthless enterprises. But with all due deference, that does not alter the case; for I believe that with some system of getting opportunity in touch with capital quite a number of small and deserving enterprises would be set agoing which could be started in no other way.

Blueprints Without Tracings

For producing blueprints from pencil drawings I make the drawing on a good grade of light-weight unsensitized blueprint paper with an H or HH pencil, says F. A. Dew, in the *American Machinist*. This grade of paper has a smooth, flat surface, stands erasing well, is cheap, and makes good prints on sun or electric paper.

Use black carbon paper, face side up, under the drawing, and main outlines or any special features can be shown up as clearly as if inked in. Dimension lines can be made without carbon, and will be fainter than outlines, and so different in appearance that it is easier to read the prints than where all lines are of the same density.

For typewritten bills of material, drawing lists, specifications and price lists, use the same paper with black ribbon and black carbon, and the prints made from these originals will come out with satisfactory distinctness.

Methods of Mining in the Anthracite Field--II

BY H. M. CRANKSHAW*

SYNOPSIS—This article describes mining methods followed in the Middle Anthracite Field, both eastern and western. In some instances buggies must be employed, although their use is avoided wherever possible on account of the extra expense involved as well as the degradation of sizes which this method entails.

The geographical formation of the western-middle anthracite beds may be seen in Fig. 8. In mining pitching beds varying in thickness from 8 to 15 ft., it has not been found necessary, as a general rule, to leave large pillars. In mining thick pitching beds and also in almost all classes of flat beds, it is good practice to leave strong pillars when doing the advance work, as the total extraction is thus often materially increased. With a bed of this description, however, the following method has worked out well. The airway (see Fig. 9) is driven 30 ft. above the gangway, and chutes connecting these passages are driven every 45 ft. A breast battery is put in on the right-hand side of the chute. The dog hole manway and back manway are then driven in the usual manner, leaving a stump between the dog hole and breast to protect the stump timber and battery collars. The breast is started 24 ft. wide, which leaves a pillar of 21 ft.; but allowing 3 ft. for each manway, the base of the pillar is only 15 ft. thick.

After the breasts have been driven up, they are left full of coal until the pillar has been skipped. To skip the pillar, the following method is used:

A skip battery SB is put in on the left-hand side of the chute from the gangway to the airway. The coal is then

*Manager, Harwood Coal Co., Hazleton, Penn.

blasted 20 ft. up the pitch, leaving a small stump SS to protect the battery collars. The old manways DM and BM (No. 1 pillar) are then strengthened by having extra sets of timber put in for say a distance of 20 to 30 ft. up the pitch, and the manways at this point are covered over by planks P to protect the miners. The miners then put on the top and bottom planks of their manway, leaving the middle open so that they can get in to blast the pillar back to the top rock in the form of a V, leaving a small pillar to protect each manway.

About 6 ft. is taken on each skip, and after a skip is finished, the center is planked up so as to keep the coal in the skip. This method is used the whole way up, keeping the old manways strengthened a certain distance ahead.

Another method sometimes employed is for the miner to work in the dog hole manway only. This manway is strengthened in exactly the same way as previously described, and protected by the planks P. The miner then,

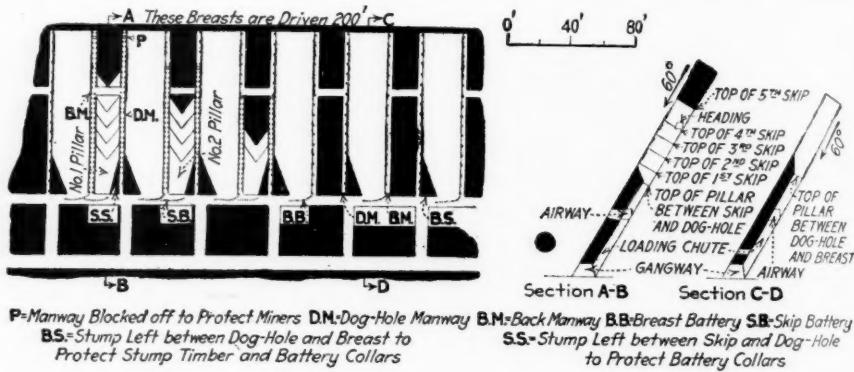
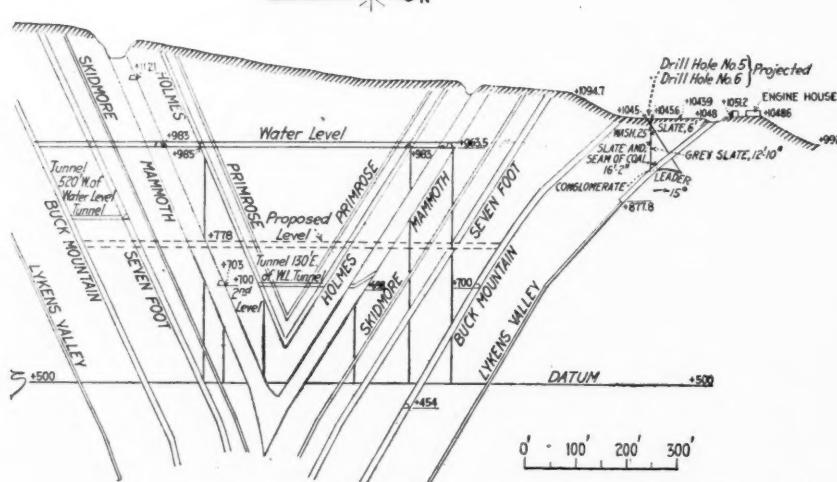


FIG. 9. METHOD OF WORKING BEDS 8 TO 15 FT. THICK ON 55- TO 90-DEG. PITCH

after putting on the bottom and top plank of his manway, blasts back to the top rock and as nearly over to the old breast as possible without destroying the other manway.

In either case, when the skip has been made the length of the lift, the skip battery and the breast battery are drawn together, thus securing a good extraction.

As an example of leaving large pillars, where the pitch of the bed is from 35 to 60 deg., the following method has been used successfully (Fig. 11). In this case, it was imperative to leave large pillars in advance work, as the nature of the ground in the mine was such that a squeeze started unless large pillars were left. The method described is suitable for coal beds 4 to 8 ft. thick on a pitch of from 35 to 60 deg. where the roof is poor. Every 80 ft., chutes are driven 35 ft. up the pitch from the gangway and connected by slant chutes. The connecting slant chutes serve as the airway. From the apex of each slant chute, breasts 24 ft. in width are started, and the straight chutes driven up the pitch from the gangway are continued directly up the pitch in the center of the pillars between the breasts. The chutes are driven with 6-ft. collar and



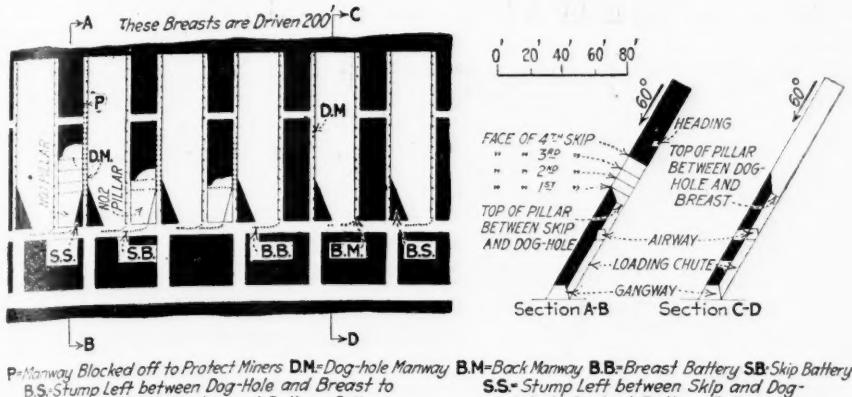


FIG. 10. ANOTHER METHOD OF WORKING BEDS LIKE THOSE SHOWN IN FIG. 9

6-ft. leg, and every fourth chute *A* (Fig. 11) is driven through to the upper level in advance of the breasts to help the ventilation.

The breasts are worked full and are not drawn down until the pillars have been cut. The pillars are worked from the top down, using the chute driven up the center of each pillar, the breasts being drawn down as the pillars are skipped back. The breasts are driven as the gangway is advancing, and as a protection against fire, a pillar is left every 500 ft. by omitting one breast, the pillar being extracted as the gangway is robbed. In the eastern middle anthracite field, the general mining conditions vary considerably, as can be seen by referring to Fig. 12. The contortions and folds are what generally cause the use of buggies and other methods of winning coal, which under favorable conditions as to uniformity of the beds and regularity of pitch would not be tolerated. Where the cover is light and the pitch of the bed about 30 deg., the following method is quite generally used in beds 4 to 8 ft. thick (Fig. 13).

From the gangway on centers of 42 ft., chutes are started 10 ft. wide and the full thickness of the bed, being driven directly up the pitch for a distance of 30 ft. and being gradually widened out until when 30 ft. up the

of breasts from being run empty, since if the breasts are run empty all the coal subsequently mined runs some distance down the pitch, thus causing unnecessary breakage. The checks should be kept well filled, which helps to prevent degradation. When the breast has been driven up the required distance of 200 to 300 ft., as the case may be, the pillars are then drawn as follows: Starting at the end of the pillar near the top of the breast, the sheet iron is thrown over close to the rib and a skip is taken off the pillar. The work of skipping the pillar is then followed up by taking off successive slices

until the pillar is robbed back within 30 ft. of the cross heading used as an airway. As there is not much cover, it is probable that the roof will not be very strong, and consequently the ground will soon cave after a sufficient space is opened, thus relieving the pressure. Should the roof, however, prove to be treacherous, cogs may be set.

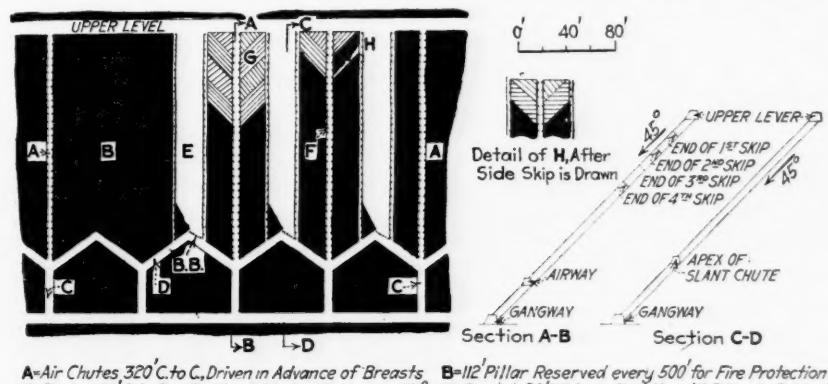


FIG. 11. METHOD OF WORKING BEDS 4 TO 8 FT. THICK ON PATCHES OF FROM 35 TO 60 DEG.

Where the surface conditions are such that it is permissible to get as complete an extraction as possible without having to consider the possibility of damage due to caves of the ground, entire attention may be devoted to getting a good extraction. In longwall work and in many methods of pillar work, a total extraction of 95 per cent.

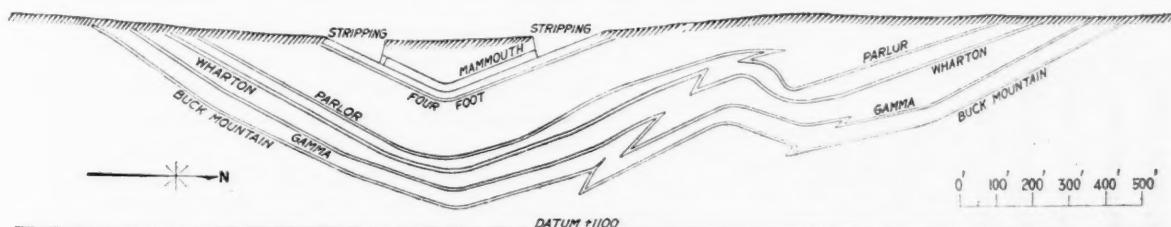


FIG. 12. SECTION THROUGH EASTERN-MIDDLE ANTHRACITE FIELD

pitch they are 24 ft. wide. A cross heading is then driven, connecting all the chutes and forming the airway; and from this point, the breast is started the full width of 24 ft. Sheet iron is then put down in the center of the breast and carried up the pitch as the face advances, props being set on each side of the sheet iron as required.

As the breasts are being driven up, checks or check batteries are put in every 30 ft. This prevents the center

is not more than can be expected, and in bituminous-coal mining, an extraction of 95 per cent. is often obtained. This figure, however, is not often reached in the anthracite region, because of the geological formation and other reasons which will not be discussed at present.

It is only possible to secure a good extraction economically when the breasts or chambers have been driven with due regard to the complete recovery of the pillars.

It is the success met with in recovering pillars which naturally decides whether the complete extraction will be good, bad or indifferent. In deciding upon what pillars to leave and what percentage of the coal should be

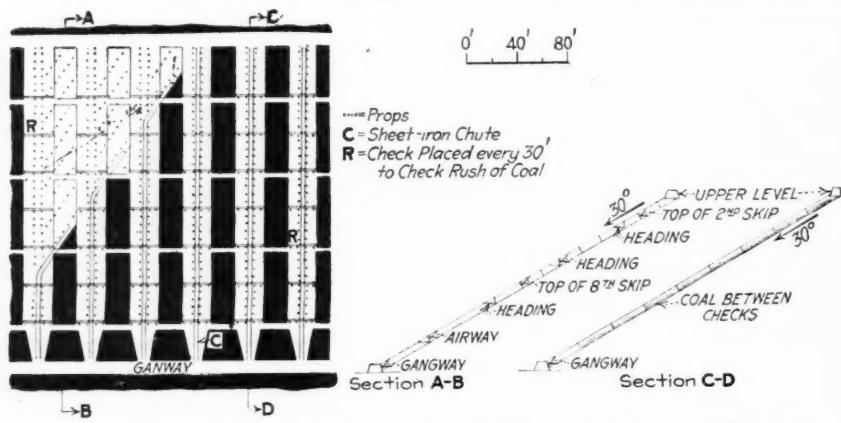


FIG. 13. TYPICAL METHOD OF WORKING BEDS 4 TO 8 FT. THICK

taken out in first mining, taking for granted that surface conditions do not enter into the question, the general practice is to leave pillars as small as possible; the idea of leaving a small pillar being that it is cheaper and easier to take out a small pillar than a large one.

This idea works out where there is not much cover and where the general mining conditions are such that the roof breaks easily. But the adoption of small pillars where they were inadequate, has been responsible for many disastrous squeezes and the loss of much coal. Pillars must be large enough to serve two purposes. They must be sufficiently strong to support the roof when the breasts or chambers are being driven up, and they must be also strong enough to break the roof when the pillars are being drawn. In the drawing of pillars, if they themselves are too small, after an open space has been made due to the partial drawing of some pillars, a squeeze comes on; and as the pillars are weak, the squeeze crushes them and in some cases closes the haulageway. If, however, the pillars are strong, when the squeeze or weight comes on, the pillars being able to support the roof directly over themselves, cause the roof to break along a line determined by the pillars; and once the roof has

broken, the open space is filled and the weight or squeeze stopped.

At a depth of over 500 ft. where the roof is strong, not more than one-third of the coal should be taken out in first mining, thus leaving a strong pillar which will allow the roof to be controlled. Fig. 14 shows a typical example of this work. The breasts are started on centers of 60 ft., and a chute 10 ft. wide driven directly up the pitch for 30 ft., at which point the cross heading which serves as an airway is driven. From the airway the breasts are started 20 ft. wide and driven directly up the pitch as previously described. This method leaves a pillar 40 ft. in width, which is not too wide to take from one side on this pitch. Thus the whole of the pillar can be removed safely, and in the event of a squeeze or weight coming on before

the pillar is all removed, the roof will break without badly crushing the pillar or pillars still remaining to be taken out.

Wherever possible, counter chutes should be avoided, as they often prove to be an expensive method of mining coal, for the following reasons:

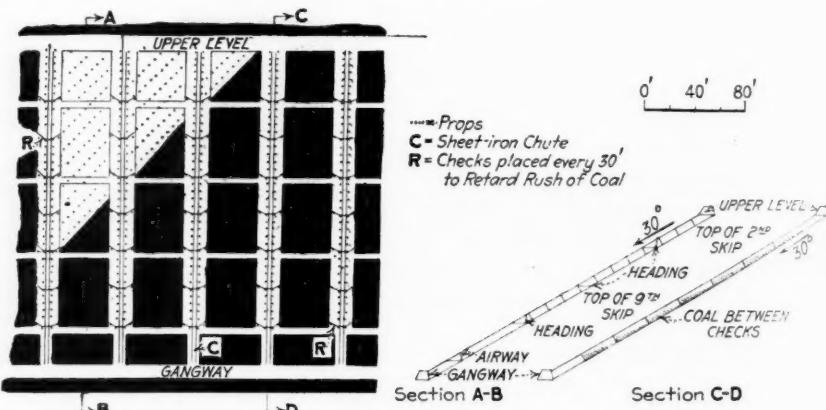


FIG. 14. IMPROVED METHOD OF WORKING BEDS 4 TO 8 FT. THICK ON 25- TO 40-DEG. PITCH

Except under special conditions, it is difficult to get timber to the working places off counter chutes.

The rehandling of coal by first of all loading into a buggy and then dumping down a chute breaks the coal and lessens the percentage of prepared sizes, while supervision is more difficult.

There are, however, many conditions met with in the anthracite field which make the use of buggies practically a necessity in some sections; for example, where a pitching bed half way up the pitch between one level and another forms a local roll, it is necessary to drive a buggy gangway along the bottom of the roll and cut through it in one place, finally dumping the coal down a chute from which it will be loaded into cars in the main haulageways.

Buggies vary greatly in size, having capacities of from 35 cu.ft. in small counters to 114 cu.ft. in large counter gangways. The smaller buggies are pushed by hand and the larger ones are drawn by mules.

As an illustration of a counter gangway, the following is given where the bed pitching on 40 deg. pinches out and then comes in again (Fig. 15). Instead of driving each breast through the pinch, which would prove to be

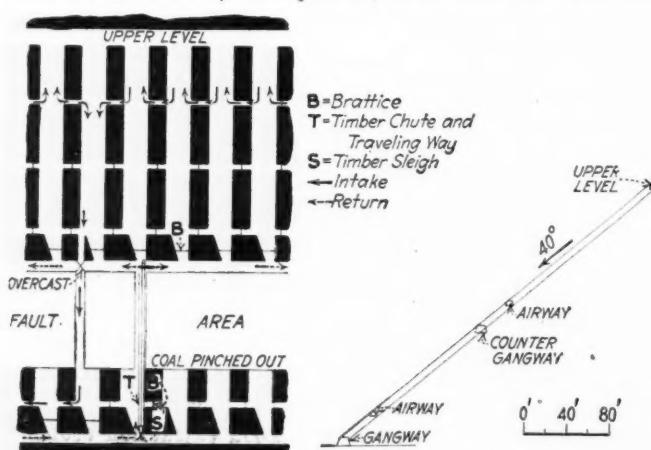


FIG. 15. COUNTER-CHUTE METHOD OF MINING A PINCHED AREA

an expensive task on account of the rock work necessary, one chute is driven through to serve as a counter chute and a second chute as an airway.

A counter gangway is then driven and breasts opened in the usual way. After the coal has been mined it is loaded into a buggy in the counter gangway; then dumped

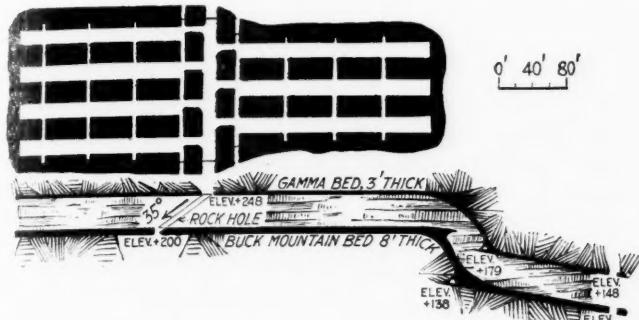


FIG. 16. METHOD OF MINING A THIN BED ISOLATED FROM MAIN BASIN

down the counter chute and loaded out into mine cars. It is advisable to drive the counter chute at least 10 ft. wide, so that if the timber must be hauled up the pitch, a sleigh *S* (Fig. 15) can be put in on the manway side, and by means of a pulley at the top of the manway and a rope attached to a mule or motor, the timber can be hauled up to the counter gangway, thus saving much unnecessary labor.

In order to show what a little determination can accomplish, the following example of working a flat bed 3 ft. thick with buggies having a capacity of 35 cu. ft. is given.

Fig. 16 illustrates the method employed, it being necessary to work out the upper bed before the pillars in the lower one could be drawn. The gangway in the upper bed was driven breast width in order to decrease the cost, and rock was not taken down except in the case of a small roll or knot in the roof.

The whole of the work was done by day work under the direct supervision of one boss. An output of over 200 tons per day was obtained from this small section and the work was an economic success.

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The First Large Borehole

BY E. B. WILSON*

The percussive drill rig developed in the oil fields of Pennsylvania must have made its debut in the anthracite fields some time between 1870 and 1890, as Dr. H. M. Chance mentions it in his book *AC* on "Coal Mining Methods and Appliances." I had the privilege of sitting on a box and watching an 18-in. diameter hole being sunk at Drifton in 1883.

Drifton No. 1 mine was so situated that spring freshets and extra heavy rains would drown that part of the mine near the portal, and as it was a natural sump, Eckley B. Coxe decided to put in at this place two extra-large pumps. These pumps were duplicates, and either one was able to handle the water under ordinary conditions, while the other was for extraordinary conditions. To pump from this sump to the mine mouth required several bends and a long pipe, consequently it was decided to use the drill hole as a column pipe.

*Scranton, Penn.

The conditions for drilling this hole which made it an experimental one were the hard blue metamorphosed sandstone, virtually quartzite, through which it passed and the fact that no hole of this diameter had been drilled up to that time with a solid bit. The time of actual drilling was 120 days, but before the hole was completed, 190 days elapsed. In order to save time when the last bit broke and had to be sent to Pittsburgh, it was decided to push a 12-in. hole through to the mine in order to center the pump, which had arrived.

The 12-in. hole was reamed to 18 in. afterward and broke a funnel-shaped piece of rock from the mine roof. However, the progress and depth were such that I could make comparisons with other boreholes that had been drilled at Drifton in the same kind of rock with different-sized bits.

The average progress made in drilling holes of different diameters was as follows: 8-in. hole, 6.14 ft. per day; 12-in. hole, 3.37 ft. per day; 18-in. hole, 3.33 ft. per day. The rule given by some authorities is "That the time of boring increases as the square of the diameter of the hole." This of course means when the same power is exerted. But with the drill rig this rule does not seem to apply, for the rod and its appendages do not descend entirely by gravity, but are governed to a great extent by the movement of the walking beam and this in turn by the velocity of the steam piston.

If the action of gravity be disregarded and the blow resulting from momentum of the tools let down by the walking beam be taken, the force of the blow will be mv^2 and not $\frac{mv^2}{2g}$, given by Callon.

Two of the large bits, which weighed 500 lb. each, broke at the thread. These fractures showed crystallization, some of the crystals having faces $\frac{1}{8}$ in. across. This fatigue probably resulted from the jarring and the vibrations of the long stem, but it may have been partly caused by the highly magnetic conditions brought about in such tools by their vertical positions.

After reaching a depth of 180 ft., the jars snapped, owing no doubt to fatigue and to lashing against the wall of the hole. The lashing might be diminished by placing a spring cage nearly the diameter of the hole just above the jars.

In order to repair the funnel-shaped hole mentioned, Mr. Coxe used a diamond drill. These drill holes he gave a proper slant so that each hole of the 20 or 22 would meet the borehole at its circumference. Drilling these holes was a tedious job, but after they were made, it was comparatively easy to dress them so as to make the pump connections water-tight.

The boring of large holes is not impossible provided proper precautions are taken to proportion the tools to the diameter of the hole. The long stem should be discarded for a short thick one, in order to prevent vibration and to a considerable extent the chipping of the bit which in the case mentioned, was annoying as it used up the metal fast, in addition to the extra expense for dressing. Holes 2 or $2\frac{1}{2}$ ft. in diameter could be used to great advantage for ventilation in many coal mines and would lessen the cost in some cases enormously. Furthermore, such holes could be reamed either by hand or machine at a cost that would throw shaft sinking undertaken for the purpose of securing ventilation into the background and render such shafts economically obsolete.

An Economical System of Mining

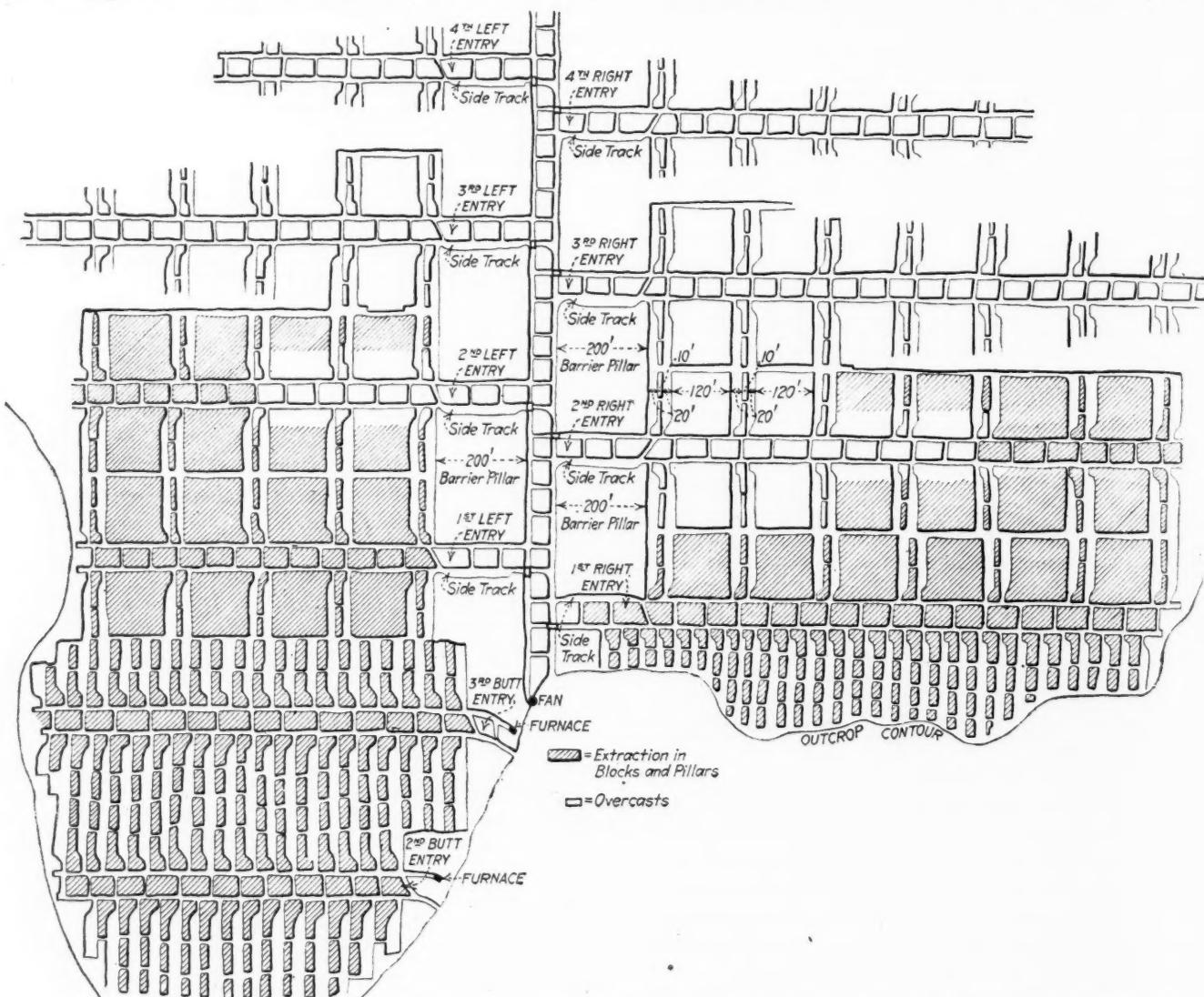
BY R. J. SAMPSON*

SYNOPSIS—A tenacious sandstone roof renders possible the driving of wide entries and a system of mining which consists mostly of pillar drawing. The work is highly concentrated, the costs low and practically the entire contents of the coal bed may be recovered.

It is seldom that conditions existing in different localities, even in the same coal seam, are identical. Consequently any proposed system of mining may be subject to changes in the details of its operation. In each mine obstacles, peculiar to that development, are encountered,

The coal is from 52 to 56 in. thick and is without parting. The top is a sandstone stratum, varying in thickness, but never being less than 20 ft. In some places there is a thin shale bed between the sandstone and the coal. At the time the system of mining was proposed this shale had not been encountered in this mine, and the conditions were peculiarly favorable to the plans adopted, being almost ideal.

The butt entries number one, two and three in the spur, projecting from the main mountain, furnish an opportunity for quickly developing an output sufficiently large to pay for the necessary narrowwork being done in the main working and, at the same time, afford the company a



MODIFIED ROOM-AND-PILLAR SYSTEM OF MINING PROPOSED FOR THE LICK BRANCH COAL CO.'S MINE, COXTON, KY.

and these may change as the work advances. As a result any system of mining may best be described in detail by citing some particular mine at which it has been applied.

The accompanying map represents a modification of the room-and-pillar system of mining as proposed for the Lick Branch Coal Co.'s mines at Coxtion, Ky.

profit. The first work done was in these entries, which were opened and rooms turned before any activity was permitted in the main entry.

Each pair of entries was a mine in itself until the rooms were driven up and connected. They were driven on 300-ft. centers, with a 25-ft. chain pillar between the entry and aircourse. An air shaft with a furnace supplied ventilation to each pair of entries.

*Douglas, Ariz.

The main workings are developed as follows: Cross-entries are turned as usual—in this instance on 300-ft. centers. A 200-ft. barrier pillar is left for protection to the main haulageway. At the end of this barrier pillar two rooms are necked, being spaced so that when widened toward the face of the cross-entry a 10-ft. pillar is left between. The width of a room, after having been widened, is 20 ft.

When they have been driven 150 ft. they are finished. Another pair is started at such a distance along the entry that a solid block of coal 130 ft. long is left between the two rooms of the pairs nearest each other. These having been driven up, a drift 16 ft. in width and parallel to the cross-entry is started to connect with a similar passage from the pair of rooms on either side. The reason for driving this connection so wide is to avoid paying yardage.

When these two connections are made, two blocks, each 120 ft. long on one end and 130 ft. on the other, are completely isolated. In this manner the entire block of coal, the full length of the cross-entry and 150 ft. wide, is blocked out. The aircourse side is developed in the same way, and the work in the two should proceed uniformly.

When the last pair of rooms has been driven up and the connection across the top of the block made, the two



CROSS-SECTION AT THE WORKING FACE

"inside" blocks on both the entry and aircourse sides are attacked along the entire face. In each pair of entries there is then 520 ft. of working face—260 ft. to each, two room pillars being pulled with each pair of blocks. The "outside" room pillar is left to be pulled with the next blocks.

The track over which cars are sent to and removed from the working face is protected by this pillar. When the work in the blocks is sufficiently advanced, the chain pillars are pulled, they being retained just long enough to provide ventilation across the working face. The work in the blocks on the entry and aircourse sides should advance uniformly, so that the pulling of the chain pillars may be accomplished without interfering with either.

Cars are pushed to the working face and taken out from the side of the block nearest the main entry. Side tracks may be provided for the cars that are being loaded, thus avoiding any delay in "gathering" the coal, which otherwise might occur. As the blocks are worked out and the chain pillars pulled, the track and even the timbers may be recovered.

The center pair of rooms is driven, in each block, to expedite development; also in driving for connection across the top, at no time is the working face more than 60 ft. ahead of the air (which is the maximum distance fixed by law in the State of Kentucky). When all the cross-entries have been worked out the barrier pillars and the main-entry chain pillars may be pulled.

The success of the system depends on the breaking of the top as the coal is removed and on the rock being of

sufficient strength to stand, unsupported, across a space some 20 ft. in width. The ordinary shale (called by the miners "slate") encountered in this district has not this strength, but the sandstone has, rooms under it frequently being worked 40 ft. in width and driven up without the use of timber.

A break some 18 to 20 ft. in thickness would be sufficient to fill the cavity left by the extraction of the coal. In case the top stands too well—that is, refuses to break of its own weight—it is necessary to shoot it down; otherwise the weight crushes the coal in the block. A row of long holes, 18 or 20 ft. back from the face, shot with giant powder will accomplish this.

In this way the immediate weight is removed from the coal, and the sandstone, once broken, may be controlled by the use of a small number of posts, placed about 20 ft. from the working face. The number of these posts required will, of course, have to be determined by experience.

The tracks are easily shifted as the work in blocks advances, the center of the loaded track being kept about 14 ft. from the working face.

In the illustration the full lines represent the development work, showing each stage of advancement. The shaded portions show the method of extracting coal from blocks and pillars.

VENTILATION IS GOOD

The air current is split for each pair of cross-entries, for which purpose overcasts are used. Ventilation is good, as the air reaches the most remote working faces without being charged with smoke, gases, etc., as it would be in a room-and-pillar system.

Each two blocks in a 54-in. bed furnish about 230 tons per cut, making a total of 460 tons for a pair of cross-entries. One machine will undercut an entire block in one shift.

The great advantage of this system lies in the fact that the work is concentrated, making it possible to get the highest efficiency from the cutting machines. In a room-and-pillar system a large percentage of the cutter's time is consumed in moving the machine from room to room. This time is all saved.

Empty cars are supplied to the face in shorter time, the motor having to do no switching. To prevent delay in gathering trips of loads, the empty track at the working face is supplied with several intermediate switches to the loaded track.

Narrowwork incident to the room-and-pillar method is almost entirely done away with, the single exception being one breakthrough to each pair of rooms. This breakthrough, however, is only 10 ft. long. This reduces the actual cost of the coal. For instance, a cross-entry 2,000 ft. long, having the first room worked at 200 ft. from the main entry, rooms 40 ft. wide on 55-ft. centers (which is the practice in some mines of this district), will have some 34 rooms, with three breakthroughs to the pair. There will then be coal yardage to pay on 255 yd. Or if the rooms are 30 ft. wide on 45-ft. centers, there will be 300 yd. of narrowwork.

For the same length of cross-entry in the previously described system there would be a total of 66 yd. of narrowwork. At 60c. per yd. this represents a saving in one case of \$113.40, and in the other of \$100.80. If the cross-entries are longer than 2,000 ft. this saving per

entry will be proportionately greater, since the deduction of 200 ft. for the barrier pillar will not be so large a percentage of the total length along which rooms are turned.

A considerable saving in steel rail is also accomplished and the track mileage to be maintained is less.

In the room-and-pillar system, even if the total tonnage left in the pillars is recovered, it is apt to be crushed and shattered, yielding a smaller percentage of lump coal than did the rooms. It is believed that a recovery of 75 per cent. of this pillar coal is a fair estimate; this would mean a loss of 10 per cent. of the entire body of coal. If the foregoing system is faithfully and carefully worked out there is no visible reason why every pound of coal could not eventually be recovered with a higher percentage of lump coal than would be secured from rooms and pillars.

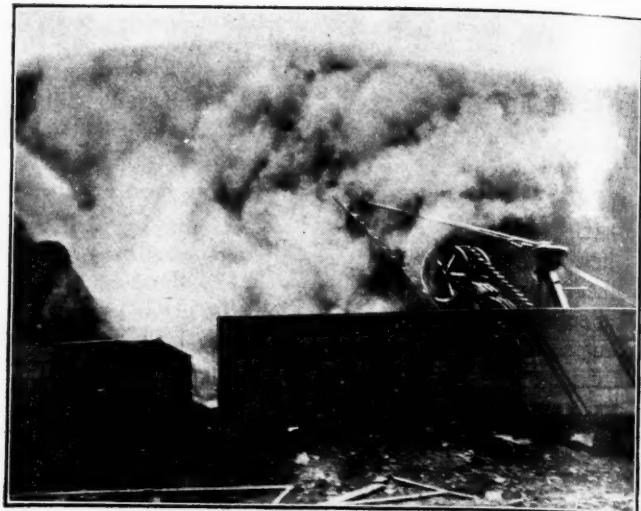
If this assumption is true, it would mean in a bed 54 in. thick, having an area of 600 acres, a saving of some 400,000 tons. There is no loss of coal from squeezing, as the success of the system depends upon immediate relief of the top pressure.

In case the top refuses to come down as expected, the system would have to be abandoned, as the cost of continued drilling of the top or the necessary cribbing would be prohibitive.

XX

Gas Explosions at Culm Bank

About 500,000 cu.yd. of culm are being shoveled into cars and taken to Duffy's field, south of Carbondale, where the Delaware & Hudson Railroad Co. is constructing a new coal-storage plant. This new plant, in which hard and soft coal will be mixed for steaming purposes, was



CULM WAS SET ON FIRE BY THE EXPLOSION

made necessary by the enlargement of the Carbondale yards of the D. & H. R.R. It will have a capacity of 200,000 tons and a floor which will hold 30,000 tons.

The machinery, which includes washers and screens, will be installed by the Link-Belt Co. Babcock and Wilcox boilers and Erie engines will supply the power. There will be 8 storage piles, 8 trimmers, 4 reloaders, 4 engine houses, a boiler house, a pump house and 2 scale houses. The work is being done under the direction of W. Sadler, division engineer, and H. R. Albright, resident engineer of the D. & H. R.R.

In course of the removal of the culm from the Coal Brook colliery of the Hudson Coal Co. by Porter Bros., the railroad contracting firm, the gas in the pile became ignited and severe explosions took place in which one man was killed and several were badly burned.

XX

Compensation in West Virginia

The rate for Employees' Liability Insurance in the coal industry of West Virginia will be based, at least for the ensuing year, on the last fiscal year's record of the companies insuring. The fiscal year begins July 1 and ends June 30. Last year a flat rate of \$2.25 per \$100 of payroll was charged, and this year the average rate will be \$2.06.

Some 268 fortunate employers will pay the old rate of \$1 a year and 39 will pay \$4. The charge of 4c. per dollar of payroll is quite a large addition to the cost of operation. The companies have a chance, however, of earning a considerable reduction; and if the previous fiscal year is always made the basis of the rating, some of those paying high rates this year may be paying the lowest rate later and vice versa. The 32 classes of insurers are given below, with the number of employers in each class and the rate for the ensuing year.

Class	Employers	Rate	Class	Employers	Rate	Class	Employers	Rate
1	268	\$1.00	12	14	\$2.06	23	2	\$8.15
2	25	1.08	13	7	2.19	24	5	3.25
3	18	1.20	14	9	2.27	25	1	3.33
4	12	1.26	15	2	2.33	26	2	3.46
5	7	1.28	16	6	2.50	27	5	3.59
6	8	1.48	17	5	2.56	28	2	3.64
7	9	1.57	18	7	2.68	29	1	3.77
8	11	1.69	19	4	2.76	30	5	3.87
9	11	1.79	20	6	2.89	31	8	3.95
10	6	1.88	21	4	2.97	32	39	4.00
11	10	1.96	22	6	3.06			



CULM PILE IMMEDIATELY AFTER THE EXPLOSION

The History of a Successful Jig

BY FRANK B. DAVENPORT*

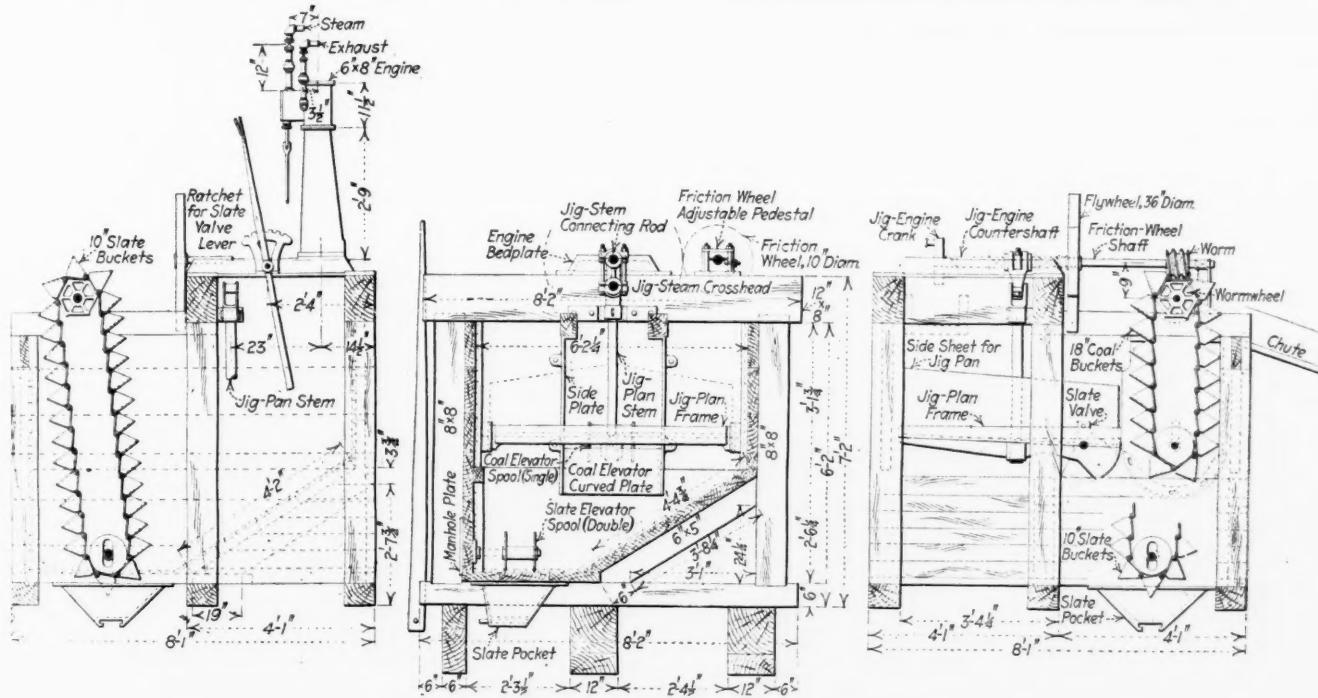
SYNOPSIS—The successful jiggling of coal was first accomplished many years ago. Not the least of the obstacles encountered was the attitude of the people who believed that with the mechanical separation of coal from its impurities the profession of the picker boys would be at an end.

In the city of Mauch Chunk, Penn., about the year 1865 or 1866, circumstances made lasting friends of three men—E. S. Louisau, William H. Plumb, of New York, and Abraham Stroh, of Mauch Chunk. The natural inclinations of these men being similar they were easily drawn together.

Mr. Louisau had come to Mauch Chunk in search of breaker refuse discarded from the collieries, and as early as 1870 formulated in his own mind a business venture far in advance of the times. He had conceived the

At about the same time Mr. Stroh designed, patented and built a coal jig. Before he had an opportunity to secure sufficient means to market his device, Mr. Plumb and Mr. Louisau made their appearance, and since they possessed greater means with which to push their interests it was necessary for Mr. Stroh to abandon his own plans temporarily and assist them. This was extremely discouraging to Mr. Stroh. Here was a rival idea apparently superior to his own. He, however, kept his secret to himself and entered his new work with a will. He made the drawings and patterns and superintended the work through the shop, erecting the machine and seeing it installed for use. This machine, a plunger jig, was an expensive and cumbersome one, and it was not long before Mr. Stroh revived hope in his own device, which could be built for considerably less.

At that time, about 1870, the Mauch Chunk Iron Works, where Mr. Stroh was superintendent and which



THREE CROSS-SECTIONS OF THE STROH JIG

idea of utilizing colliery refuse in the manufacture of briquettes.

Mr. Plumb was pursuing another theme. During his travels after the Civil War he heard of Mr. Stroh and his marked ability as a mechanic. He believed that here was the man he was looking for and one who doubtless could help him. Mr. Plumb had in mind the separation of coal, slate and rock by means of a pulsating stream of water. He had a more or less clear conception of what he desired, but lacked the ability to design such a machine.

Mr. Plumb and Mr. Louisau had been acquainted with the coal business previous to their migration to Mauch Chunk. With the discovery of an able mechanic such as Mr. Stroh their past dreams began to materialize.

was located up the creek from the city, was an important shop, furnishing the major portion of machinery for that section of the anthracite region. This included Summit Hill, Hacklebarney, Nesquehoning, Drifton and Jeddo mines. Compared with modern shops, this one was primitive, an overshot water-wheel furnishing the power. This saw service, however, for a long term of years, in fact until the entire plant was destroyed by fire in the spring of 1916.

I believe I am right in assuming that Mr. Stroh was a real genius. Through his ability as a mechanic he was able to build a machine to separate coal and slate by taking advantage of their difference in specific gravity. In this he was ably assisted by his friend and companion, Eckley B. Coxe, of Drifton, a hard worker and studious inventor.

There are no records extant of any attempt prior to 1870 to jig or wash coal by machinery, in the anthracite region at least. This idea, however, soon developed a new and important industry, and the washery is now looked upon as an indispensable part of modern colliery equipment. The saving in labor and material effected by machines of this kind is beyond question. Everyone today is anxious to save and conserve carbon minerals, and the conception of a machine for accomplishing this result at the time of which we speak was a long step forward.

The Stroh machine, having been built and tried out at the shop, was finally ready for a trial in service. It was first placed in the Jeddo breaker under the supervision of Mr. Stroh's foreman. Mr. Stroh was, of course, extremely anxious to see his invention in practical operation, but the attempt to operate this machine almost cost him his life. It was discovered by the slate pickers and their parents that this machine would "cheat the little boys out of a living."

Mr. Stroh had sent his shop foreman to Jeddo to supervise the erection of the jig. This was in the spring of 1873. He, himself, left Hazleton to see the machine started. The people of Jeddo were out to meet the train in force, having been informed previously that the jig was to start upon this particular morning. Mr. Stroh was hardly off the train before he was set upon by an infuriated mob, and it was with some difficulty that he again boarded the cars. He succeeded, however, in getting aboard the train before it pulled out and continued on to Driftton, and there awaited another train back to Hazleton. He was somewhat the worse for wear, but more determined than ever to "make it go."

The prejudice of the slate pickers and their relatives represented a new and serious obstacle, but Mr. Stroh

met this squarely, and finally convinced the general populace that their children ought to be in school and not in the breaker.

After the installation of the experimental machine at Jeddo, and the restoring of public confidence, the field was open for future development. Soon other machines began to appear, until at present this original but primitive device is supplemented by eight or ten other efficient and capable machines, all accomplishing the reclamation of waste.

The general dimensions of the Stroh jig were about 8 ft. square and 7 ft. high, the frame containing everything pertaining to the operation of jiggling, including the water. Upon the frame was mounted a 6x8-in. steam engine which imparted the oscillating motion to the jig pan. This pan was made of cast iron and was about 60 in. in diameter, holding the coal and slate during the jiggling process till the former was deposited on top and the latter on the bottom.

The accompanying drawing of this machine may be easily understood. Of course the early Stroh jig was not the machine shown in the illustration, as this embodies many improvements over the original. The inventor, however, took advantage of these imperfections and some failures, and corrected them as they developed.

Mr. Stroh lived for many years after the introduction of his jig, but contrary to expectations, did not die a wealthy man. He had every reason to be assured of a comfortable old age through his inventive and mechanical ability. Poor financial counsel and lack of ability to save money deprived him of many of the legitimate fruits of his labor. The Stroh jig, however, is a monument to the genius of its inventor, a man who, in the matter of foresight, was many years ahead of his time.

* * *

Coal Handling on the Norfolk & Western Ry.

SYNOPSIS—A brief description of the coal-handling facilities of this road and the methods used. Over half the coal dumped at the Hampton Roads piers originates on this line. A new coal pier, 90-ton coal cars and heavy Mallet locomotives, each representing the maximum development in their respective lines, are items of special interest.

The Norfolk & Western is primarily a coal-carrying road. Over 85 per cent. of its revenue is derived from freight, as compared with 11 per cent. from passenger traffic. Of this freight traffic approximately 71 per cent. consists of bituminous coal.

Because of topographical and other conditions the relations existing between the operators in the coalfields of West Virginia and the railroads differ from those in most other fields. In nearly all cases in West Virginia only one road taps a particular field. Thus the Baltimore & Ohio, the Chesapeake & Ohio, the Virginian and the Norfolk & Western each serve particular areas with little or no competition. The development of any particular field is there-

fore dependent very largely, if not entirely, on the service afforded by the road serving that area.

Under these conditions the growth of the tonnage of coal handled by a road is one measure of the character of the service afforded the coal operators along its line. In 1910 the coal tonnage of the Norfolk & Western amounted to 13,986,054 tons. In 1915 this had risen to 23,280,110 tons, an increase of 67 per cent. in five years.

The coal traffic of the Norfolk & Western originates between Graham, Va., and Williamson, W. Va., a distance of 104 miles. This district produces normally about 2,000 cars of coal daily, in addition to about 100 cars of coke. A total of 214 mines and 2,034 coke ovens, owned by 146 companies, were in operation in this district on June 30 last. The largest individual area is the Pocahontas field, extending from Graham to Welch, 27 miles. This field includes 86 mines, the output of which is about 105,000 tons daily, or about 62 per cent. of the total coal tonnage of the road. One short branch alone produces over 400 cars of coal each day.

About 60 per cent. of this coal goes west to Columbus for movement over the Lakes via Toledo and for distribution through the Central West by rail. Of the 40

per cent. of the total coal output which goes east about five-eighths goes to tidewater and the remainder to points along the line and to connecting lines. At the present rate of production it is estimated that there still remains in the fields immediately tributary to the lines of the Norfolk & Western over 5,000,000,000 tons of coal, or sufficient to continue operation at the present rate for 100 years.

THE COAL PIER AT HAMPTON ROADS

As stated, the coal operators of West Virginia are dependent very largely upon the facilities afforded by the particular railway serving their individual fields for transportation facilities which enable them to compete with other fields. This is especially true with reference to that coal which goes to tidewater for export or for bunker use, for, other things being equal, a boat will go to the dock that offers the best facilities and the least delay, and will take on coal coming from the mines shipping over that line. The coal operators therefore benefit equally with the road from the construction of modern terminal facilities. For this reason the completion of the new steel coal pier at Lambert's Point, Norfolk harbor, in 1913, supplementing two existing piers at the same point, formed a very important improvement from a traffic as well as an operating standpoint.

This new pier is the largest on the Atlantic seaboard and has a capacity of 1,000,000 tons of coal per month. It is possible for it to load a boat with 5,000 tons of cargo in 2 hr., a task which formerly required 18 hr. As much as 17,000 tons has been unloaded over one side of the pier in 10 hr. The total tonnage handled over the Norfolk piers of the Norfolk & Western has increased from 2,780,402 tons in the calendar year 1908 to 7,530,607 tons in the calendar year 1915, an increase of 171 per cent. in eight years. The highest individual monthly loading was 853,845 tons in June, 1915. This road handles over one-half the entire coal tonnage shipped from this harbor, although both the Chesapeake & Ohio and the Virginian operate large coal docks at this same point.

THE 90-TON CAR AND MALLETT LOCOMOTIVES

Another important step in the handling of this coal traffic was the design and construction of a steel gondola car with a rated capacity of 90 tons and an actual capacity with 10 per cent. overload or 99 tons. In 1915, 750 of these cars were placed in service between the West Virginia coal fields and tidewater, and 1,000 additional cars of this same design have been ordered built at the Roanoke shops recently. This is the largest car ever built for general service, the nearest approach to it being the 140,000-lb. capacity cars built three years ago by the Chesapeake & Ohio. Their economy lies in the fact that, with overload, the percentage of revenue loading to total weight is 75 per cent., as compared with 60 per cent. for the average 50-ton car. In operation, a few of these cars are commonly placed at the head end of each train to give shorter trains for all, rather than operating them in solid trains. While their limitation to tidewater service requires some additional switching at the mines, this is more than offset by the economies effected in transportation.

One of the most important operating economies has been secured through the general use of Mallet locomotives for road service. In May, 1910, 10 locomotives of this type

were purchased. Based on their successful performance, 40 more were secured in 1912, and others have been bought at intervals since that time, until 128 are now in use. The latest Mallet locomotives used on the Norfolk & Western have a weight of 337,300 lb. on drivers and a tractive power of 73,000 lb.

These Mallet locomotives are used on the Pocahontas and Seioto divisions for all tonnage trains, with Consolidation locomotives on time freight trains. The Mallets are also used largely, but not exclusively, east of Bluefield. Consolidation engines are employed exclusively on the mine spurs and in the yards, no special switching power being built. One of these Mallet locomotives will haul 5,000 tons from the coalfields to Columbus without assistance, while east from Bluefield it will haul 4,300 tons to Roanoke, with a helper for seven miles at Christiansburg.

ASSEMBLING AND MOVING THE COAL

As stated, about 2,000 cars of coal originate in the territory between Bluefield and Williamson daily, and most of this between Graham and Welch. To keep the mines in this vicinity supplied with empty cars and to remove the loads without delay and congestion require a careful organization. Consolidation locomotives and crews are employed continuously on these mine spurs to do the switching and to bring the loads out to small storage yards located between the main tracks at the junctions with the mine spurs.

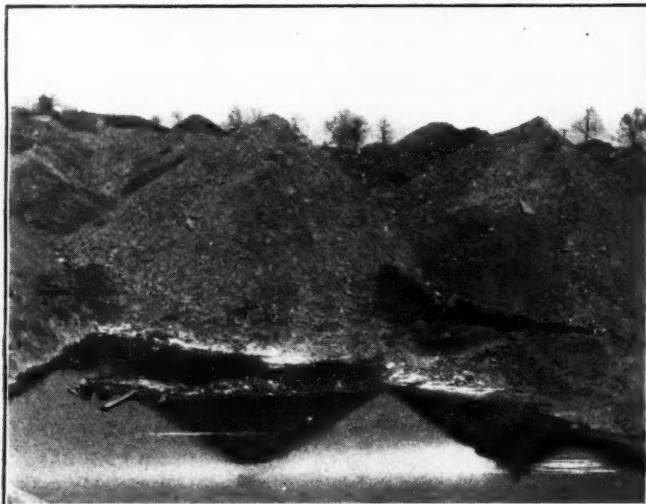
For operating purposes the main line is divided into two sections by Elkhorn tunnel. The mines east of the tunnel are served by trains which bring empties out of Bluefield to these mine spurs and return with the loads, setting out westbound loads at Flat Top yard, eight miles west of Bluefield. The line west of the tunnel is served in the same manner by crews working out of an intermediate terminal at Eckman, three miles east of Vivian. Crews also run from Eckman direct to Wilcoe on the Tug Fork branch, where they secure solid trainloads of coal for westbound movement. Other crews also operate turn-around runs between Williamson and Eckman and between Williamson and Bluefield, the latter crews hauling the eastbound coal from these various storage yards to Bluefield and the westbound coal from Flat Top yard and intermediate sidings to Williamson.

As the coal comes from the mines, that billed east moves under a white tag and that west under a green tag, which tags show full billing information. At the classification yards at Bluefield and Portsmouth the cars are weighed and waybills made out. The classification at these yards is heavy, because of the large number of coal operators and grades of coal. There are 65 different classifications for the coal moving over the Great Lakes alone. Coal for tidewater is billed to consignee by grades and about 2,500 cars are usually held in the storage yard at Lambert's Point. As far as possible, trains are made up at Bluefield for movement direct to the coal pier, without the necessity of doing any switching at intermediate terminals.—*Railway Age Gazette*.

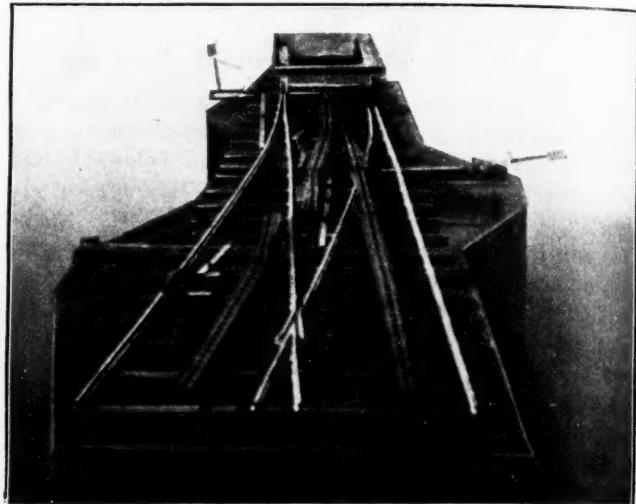
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The Fairmont Chemical Co. Will Make Sulphuric Acid from the sulphuric balls in the mines. A plant will be built at Fairmont, W. Va., for \$75,000 and \$25,000 will be kept for working capital. Ludwig Theil, a chemical engineer of Columbus, Ohio, is in charge of construction.

Snap-Shots in Coal Mining



SPOIL BANK AT STRIPPING OPERATIONS OF NEW ENTERPRISE COAL CO., MARION, ILL.



AUTOMATIC RACK-RAIL SWITCH IN USE AT RALEIGH COAL AND COKE CO.



RUBBER BELTS FOR PICKING NUT AND EGG AT AMERICAN COAL MINING CO.'S PLANT, BICKNELL, IND.

The Use of Squibs vs. Fuses

SYNOPSIS—*The results of a thorough study by the British Government of the respective merits of squibs and fuses indicates a decided preference for the former, except in gaseous or wet places where the latter are the choice. The chief advantage lies in the minimized danger of hangfires and misfires.*

The British Departmental Committee recently conducted an exhaustive investigation into the use of squibs in mines, which brought out a great many interesting points on this much-discussed problem. The accompanying excerpts from the committee's report embody the leading opinions advanced and the main facts developed.

ACCIDENTS WITH EXPLOSIVES COMPARED

Mines Inspector J. B. Atkinson stated that during the period 1902-12 forty-one fatal accidents that resulted in the death of forty-two persons were caused by explosives underground at mines in the Newcastle district. Six of these deaths were caused by the handling of explosives away from a shot hole, three occurred while charging or stemming, and one was because a miner returned to his shot too soon and was overcome by the fumes.

Thus there were thirty-one accidents with thirty-two deaths, directly attributable to the explosion of completed shots, of which nine were caused by shots ignited by squibs; but of these latter two were caused by shots blowing through into adjoining places, six were because of shots exploding on the miner (probably in all cases while in the act of lighting the shots), and one was caused by returning too soon after a shot had apparently missed fire. Fourteen accidents occurred with electrical firing and eight from firing by fuse.

Roughly speaking, during the time under review, 60,000,000 shots were fired by squibs, 25,000,000 by electricity and 6,600,000 by fuse. This would give the relative safety of squibs as eleven times greater than a fuse and 4½ times as safe as electrical firing.

Taking figures covering a five-year period and making a comparison of a limited nature, Divisional Mines Inspector Atkinson showed that per death, 12,668,247 shots were fired by squibs, 60,583,149 by fuse and 13,953,413 by electricity; and for each person injured the figures were 1,919,431, 3,029,157 and 4,186,024 respectively.

CHIEF ADVANTAGE OF SQUIBS

Mines Inspector A. D. Nicholson stated that in the naked light coal mines of Durham, gunpowder shots have been fired for generations by means of squibs and the miners are so accustomed to this method that they prefer it to any other. The chief advantage of the use of squibs as compared with fuse consists in the relative safety in the case of hangfires and misfires. With a squib there is no danger of a shot going off after ten minutes has elapsed, while with fuse a shot may explode hours afterward.

Even with electrically fired shots there have been authentic instances of the charges detonating after the cable had been disconnected. In the case of a misfire with a squib, a fresh one can be inserted, while in the

case of a fuse a fresh hole must be drilled. This tempts the miner to drill out the stemming, often with fatal or serious results.

Cases of misfires with squibs are generally owing to carelessness in stemming, or occasionally to faulty manufacture. The principal danger to be apprehended from the use of squibs is that of premature explosion, though this can nearly always be attributed to improper usage. Squibs as a rule take from 1 to 1½ min. to "run," and as this often seems a long time to an impatient miner, he rips off a small portion of the sulphur tip in order to expedite matters, sometimes with the result that the shot explodes before he has reached a position of safety.

NIPPING AND BENDING "TOUCH" CONDEMNED

Divisional Inspector W. Walker stated that the practice of nipping a piece of the "touch" of a squib causes many premature explosions. Originally, squibs were made by the miners themselves, and even when the manufactured article was introduced the miners were loath to use the attached touch, as they were suspicious of anything with which they had not had experience.

The inspector is of the opinion that the use of squibs in places where there is likelihood of inflammable gas and not too much water is much to be preferred to fuse. The squibs are more easily handled and manipulated, do not make so much smoke, and there is less danger of a misfire. Generally speaking, squibs might be allowed in all mines that work under naked lights, but under no circumstance should they be permitted where safety lamps are used solely. Where squibs are employed it should be made compulsory to light only one shot at a time.

Professor J. H. Merivale, acting for the coal owners of Northumberland, stated that one important advantage of the squib was that it is possible to examine it though you cannot examine a fuse. If there is no rattle made in shaking a squib it proves it is full of powder. If it makes a noise it is not full of powder, and it might possibly misfire. The presence of the powder can also be determined by squeezing the squib. A man who is interested in his life can and does examine his squib before he uses it.

As a matter of fact it is difficult to see how it is possible to have an accident with a squib, except a willful one. The case of the squib is coated with silica so that there cannot be any smoldering, and if it goes out there is nothing left to burn.

EVIDENCE OF A MINERS' SECRETARY

Robert Brown, a Scottish miners' secretary, who it may be mentioned incidentally has had some experience in the United States, brought out the following points: (1) Squibs are safer than fuse where black powder is used and the work is dry. (2) In stemming or tamping there is always a risk of the fuse being cut or bruised to such an extent as to cause it to hangfire or misfire. (3) The stemming with fuse cannot be done so firmly without running the risk mentioned in (2), and apart from the risk of injuring the fuse the shot is sometimes not so effective owing to the stemming being blown out. (4) The spit of the fuse sometimes puts the man's light out. (5) The depth of the shot holes makes no

appreciable difference with regard to time when firing with a squib, whereas two or three feet of difference with a fuse leads to mistakes being made when more than one shot is being fired at one time. (6) The smoke and fumes from a fuse are bad for the workmen and the general ventilation, especially so in narrow work.

TEN REASONS FAVORING THE USE OF SQUIBS

Dugald Baird, from Ayrshire, Scotland, advanced the ten following reasons why it is much safer to fire black powder shots by means of squibs than by fuse:

1. Squibs are safer because they do not hangfire like a fuse that may lie dormant for many hours before going off, and men prefer to go home rather than run the risk of going back on a fuse shot. The fact that the Home Office allows a miner to return to a misfire squib shot after ten minutes and requires one hour to elapse for a misfire fuse shot shows that this is recognized.

2. The spit of the fuse when it is being lit often puts out a miner's lamp and then he has to scramble out as best he can to a safe place.

3. Fuse cannot be fixed properly to loose powder cartridges.

4. The tamping cannot be rammed so firmly with a fuse; if the usual force is employed, the fuse may be cut in the process and so cause a misfire.

5. A fuse is more dangerous in longwall places, owing to the differences in time of going off, attributable to the extra length of fuse, which may be anything from 2 to 5 ft., according to the depth of the shot hole. There is also the difficulty of lighting simultaneously; one man may light his fuse in two seconds while his neighbor may take a minute. With a squib, the time of lighting and the interval until the shot goes off are practically the same, no matter what the depth of the hole.

6. Owing to the extra quantity of smoke emitted by a fuse, the men cannot get back so soon after the shot has been fired and thus valuable time is lost. In addition to this the pungent smoke is bad for the workmen's lungs; in narrow places this is very pronounced, even where the ventilation is well attended to.

7. A misfire with a fuse means the total loss of the shot. Next day the man has to bore a fresh hole near the old one, not knowing the moment the fuse in the latter may go off.

8. In firing a shot with fuse and loose powder cartridges, the end of the cartridge must be opened to insert the fuse, thus laying the powder bare. With a squib the cartridge does not have to be opened at all. This also applies to compressed powder; the bare pellets of powder must be strung over the fuse.

9. A man can examine a squib for blanks, but not so with fuse.

10. With squibs, in tamping the hole there is no inducement for the miner to use coal-gum or other dry material. The only advantage that the use of fuse may have over squibs is when the shot hole is a wet one.

¶

The Essential Difference Between Byproduct and Beehive Coking is that the latter is a burning process (with necessary limitations as to the amount of air admitted to the oven), and the former is purely a distillation process, involving external heating. The product of the one consists of coke only and that of the other, besides a larger quantity of coke from a given weight of coal, in some cases includes a large volume of surplus gas and in all cases valuable residuals in the form of coal tar and ammonia, or ammonia compounds.

Recollections of a Manager

Every man gets an idea sooner or later that his line of business carries the largest number of worries and requires the greatest amount of tact. In my case that idea took possession of me soon after I became manager.

It happened that about that time our company was fighting a proposed change in railroad rates that would have curtailed our market considerably, also endeavoring to satisfy the tax commissioners as to the accuracy of their tax assessments.

The railroad-rate matter necessitated a long and tiresome hearing before a special examiner sent out by the Interstate Commerce Commission. All parties interested had lawyers on hand to look after their interests, which meant that every time a coal consumer or a sales agent of a coal company or a railroad man got up to make a statement, six lawyers began to take down notes; and the witness who arose to make a simple statement ended by answering some one thousand questions (more or less—not always less I can assure you) before he was allowed to resume his seat. As each witness concluded his testimony all the lawyers jumped to their feet, and then followed long arguments about "precedent" and "admissibility of testimony"; the special examiner was generally in doubt as to the proper ruling and found it necessary to have his stenographer take down everything that was said, apparently to the disgust of the lawyers. My part in the affair required me to sit beside our attorney so that I might quickly give him any information that he should request, and also to suggest questions to ask the ones who claimed that the rates needed adjustment. I was close enough to the lawyers to hear their half-whispered comments, one to the other, but too close to tell them what I really thought about them.

The hearing before the equalization board of the State Tax Commission came a week later.

This time there were no lawyers in evidence, probably because there were no questions of "precedent" to be decided, but simply "questions of fact."

The officials of all the coal-mining companies of our district had had numerous conferences to decide upon a course of action, but found it impossible to agree; and as a result each company had a different explanation to make to the board, hoping to convince them that the board's basis of valuation was absurd and in all fairness to the operators of the state should be abandoned.

When my turn came to appear before the board they had already heard a number of the operators' representatives and had become disgusted with the pleas set up. They promptly informed me that they had no desire to enter into a discussion covering the unreasonableness of taxing reserve coal lands nor the connection between the conservation of such coal lands and coal-land taxation. The law now on the statute books required that everything of value in the state should be assessed at a certain percentage of its actual value, and the state employed them to see that the spirit of the law was carried out.

It is a fairly difficult matter to put a valuation on coal lands that have not been systematically prospected, so most of the coal companies only laughed at the assessors and dared them to alter the assessments as made. We were differently situated, however, as our coal lands were given a certain value when our company issued its bonds, and the figures were public property. For that

reason, our directors had warned me to talk cost sheets and conservation with the equalizing board and steer clear of all other phases of the subject. The board's warning as to the testimony that they would and would not hear from me made it evident at once that anything that I might say would be rejected, so I retired in favor of our land agent. He satisfied the board as to the reasonableness of our assessment as turned in, and I was congratulated later by our board of directors for the way that I handled the assessors.

X

Treatment for Absenteeism at British Mines

As a result of the heavy enlistment of miners, together with the urgent demand for fuel on the British coal industry, the problem of keeping the men constantly at work has been a difficult one.

This has apparently been solved by one company, where the men by popular vote have set up an unofficial court to deal with all cases of absenteeism. They have elected six of their own number from each colliery to act with four representatives of the owners, two mine managers and two under-managers. The result is an Absenteeism Board, in which the men have an overwhelming majority. But the harmonious character of the court is shown by the fact that the twelve miners on the board elected one mine manager as chairman and the other as vice-chairman.

Every case of slacking in the mines is known to this board. A miner, to be exempt from the operation of the board, must make a minimum of 80 per cent. in attendance, if physically fit to do so. It is felt that if the men with a tendency to lose time are kept up to this schedule, the better-class workmen who, of course, heavily preponderate, will bring the percentage up to something quite satisfactory when all circumstances are considered.

A workman convicted of failing to maintain the standard of attendance is fined anything from half a dollar to five dollars. He is not mulcted in damages, as he would be if taken before a magistrate, and he loses no work, as he would if he had to attend the district police court. His fine is handed over to the workmen on the board and they are allowed to devote it to whatever charitable purpose they may select. The board is at liberty to give a miner leave to absent himself from work for a specified period, in circumstances which, in the view of the board, justify the leave, such as illness, bereavement or some exceptional domestic incident, as a visit of a son from the front.

It is difficult to say yet how the scheme will work out in practice. In the majority of instances the miner who has been convicted by his own deeds of slacking will pay and look pleasant and will probably go back to his work determined to do better. If, however, he is not satisfied with the verdict of the board, he has his right of appeal. He can sue the board in the County Court for the recovery of money which, he may contend, has been illegally and improperly deducted from his earnings, though by a tribunal which he has himself had a voice in electing.

In such an event the fine would be remitted without demur and the matter would pass out of the hands of the Absenteeism Board. But the company would then

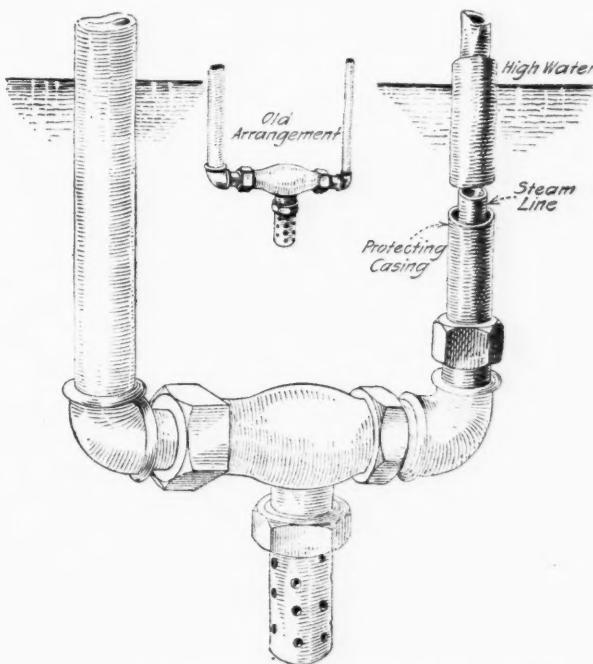
substitute the machinery of the Employers and Workmen Act and would claim for the damages they had foregone in the other case. And it is most unlikely that a man who had been convicted by his own comrades would receive greater leniency at the hands of a magistrate or a County Court judge. The last state of the man would probably be considerably worse than the first.

This experiment has most attractive features, and where the integrity of the Absenteeism Board commands the respect of the workmen who come within its jurisdiction, the plan is almost bound to work smoothly and successfully. If it will knock off 10 per cent. of slacking in one place it will do the same, and perhaps more, in another.

X

Protecting Submerged Steam Pipe

At a certain mine plant where fuel is cheap, an ejector is used to elevate the water to the main supply tank. During the dry or summer season very little difficulty was experienced, but in the winter, when heavy rains or thaws



STEAM PIPE PROTECTED FROM COLD WATER

come, the water in the creek rises so that the steam line to the ejector is submerged about 3 1/2 ft. With the temperature about zero, the steam pressure was lowered so that the ejector would not throw enough water to supply the demand, and on several occasions temporary shutdowns resulted.

There are railroad tracks situated between the tank and ejector and the piping is underground, so that repiping would be expensive. To overcome the trouble, a casing was placed around the steam pipe by using a larger pipe and making a water-tight joint at the bottom, forming a sleeve so that the water could not come in contact with the steam line, as shown in the illustration. This saves considerable steam, and so far no more shutdowns have occurred on account of the device failing to throw sufficient water under the circumstances above detailed.—J. L. Ball in a recent issue of *Power*.

Miners Should Work 8 Hours

BY AN ANTHRACITE CORRESPONDENT

SYNOPSIS—*The miners have agreed to work eight hours in the anthracite region, but they are refusing to do any more than enough to produce a certain tonnage. They believe it is degrading for them to do work such as is being done by the laboring caste. The more the contract miners are paid the less work they do.*

Article 3 of the agreement signed May 5, 1916, between the Anthracite Mine Workers' Organization and the anthracite operators, stipulates that "an 8-hr. day means 8 hr. of actual work for all classes of labor at the usual working place, exclusive of noontime, for six days per week—if the operator desires to work his mines to that extent—excepting only legal holidays." This part of the agreement, however, though it had the unqualified indorsement of Pres. John P. White, has been the cause of constant irritation to the operators and has been honored more by its breach than by its observance on the part of the miners.

Attempts have been made to impress the public with the idea that since the 8-hr. day has been written into the agreement the operators have insisted that each man shall stay in the mines the full 8 hr. whether there is any work for him to do or not. Color has been given to this claim because of the refusal of superintendents in a few instances to interrupt the hoisting of coal and the regular operation of the colliery in order to hoist miners who had left their working places in advance of the regular quitting time, and without any better reason for doing so than that they wanted to go home.

The whole trouble regarding the interpretation and the execution of the 8-hr. clause rests with the contract miners, who because of the peculiar conditions in the anthracite region (these conditions being aggravated by a law of questionable wisdom requiring employment for two years in the anthracite mines as laborer before a certificate to work as a miner can be obtained) have come to consider the contract miner in a class by himself and not subject to the rules and regulations nor to the agreements governing the other employees.

The conditions of employment differ somewhat in the Northern (Lackawanna and Wyoming) region and in the Middle (Lehigh) and Southern (Schuylkill) regions.

In the first, where the coal beds lie relatively flat, the contract miners employ their own helpers or laborers, who load the coal into the mine cars, while in the other regions, where the beds are generally pitched at a sharp angle, most of the coal after being blasted down by the contract miner is loaded out by "company men."

MINER RESTRICTS THE OUTPUT OF HIS LABORER

The anthracite contract miner of the Lackawanna & Wyoming region, sometimes of his own volition and sometimes because of local union rules, limits the amount of work he is to perform each day. For instance, if 4, 5 or 6 cars constitute what is ordinarily termed a shift, the miner will mine the coal for that number of cars and no more. The laborer the miner employs is supposed to load the number of cars provided for the shift.

He could, in most cases, load one or two more cars a day if the miner would help to load the cars and would mine the coal to fill them. This would naturally result in increased earning capacity both to the miner and his helper. The principal labor shortage around the anthracite mines is among the miners' helpers, a situation that would be appreciably relieved if the miners were less impressed with the superiority of their position and were more inclined to consider their own real interests, as well as those of their employers and the public.

There is always, under the conditions that now exist in the anthracite region, work for the miner to do if he wants to do it, and if he remains at his working place with his laborer the full 8 hr., the result is bound to be reflected in his increased earning capacity. The miner, however, has grown to believe that he lowers his status and somewhat bemeans himself if he does anything to help his laborer. He feels that his duties should be confined to the blasting of coal and the timbering of the working place, and that he should not be compelled to assist in loading.

There has thus grown up in the anthracite mines a system of caste in which the lines, so far as the class of employment is concerned, are as tightly drawn as those in Hindostan, notwithstanding President White's interdiction of any aristocracy of labor in the anthracite fields.

SAFETY REQUIRES 8-HR. PRESENCE OF MINER

There is another, and no less important element, which actuates the operator in insisting upon the observance of the 8-hr. day by the miner, and that is the matter of safety. It must be remembered that hundreds of miners and their laborers are scattered by twos and threes throughout a colliery, and that the foreman can at best visit each place not more frequently than twice a day. It can be readily understood by the readers of *Coal Age* that the miner is responsible for the safety of the working place as long as his laborer is at work. In fact, prior to the present wage agreement and the establishment of the 8-hr. day, several companies had rules in effect which stipulated that when the miner left his working place he must be accompanied by his laborer and that the laborer should not be permitted to work alone.

The foregoing remarks regarding the miner and his laborer apply chiefly to the northern field. In the vertical or steeply pitching veins of the Lehigh and Schuylkill regions, where the question of the laborer does not apply to the same extent as in the Northern region, the coal, although cut or blasted by miners, is loaded by "company men," who are regular employees of the companies and are not paid by the miners.

In these regions, however, as in the Northern or Wyoming region, the habit of the miner to limit his shift to so many feet or yards of work carried forward and leaving his work as soon as this is completed is much in evidence. Most of the contract miners are out of the mines by two o'clock in the afternoon instead of completing their 8 hr. of work, which would require their remaining in the mines until half-past three in the afternoon.

As in these districts the coal is loaded by company men, the miner can stay at work as long as he desires to do so.

The fact, however, that he quits work earlier increases the cost of anthracite, in that it prevents the concentration of output and means a falling off in the number of mine cars that may be hoisted in the afternoon hours. It necessitates the loading of coal at night in order to have a start in the morning which could be avoided if the miners would continue their work up to the regular quitting time.

TACIT UNDERSTANDING TO DO MEAGER DAY'S WORK

The meat in the cocoanut really seems to be that there is a tacit understanding among the contract miners that they will maintain their earnings at a certain average and will work only enough time to produce that average earning. It has also been observed that with each advance in wage rates that has been given to the miners there has been a decrease in hours worked, rather than an increase in net earnings. It is a safe bet that there are not 10 per cent. of the contract miners in the anthracite field that work 8 hr. a day under ordinary, everyday conditions.

There are, of course, in each mine a few men who work longer hours and make more money than the average. These men are always under suspicion by the rank and file and are known as "hogs," for while they are members of the union, they will not limit their hours to those the union tacitly prescribes.

Everyone familiar with the coal trade knows that there is at the present time a notable shortage of labor in the anthracite region. The operators are barely able to meet present demands and have been unable to store any supplies in anticipation of a greater demand during the coming winter. All efforts, however, to secure a greater "intensity of labor" and an increased output have been unavailing. If the miners were not indifferent to the situation, and would endeavor to relieve it by taking advantage of the opportunities offered to them, the mines would be producing a million tons more a month than they are actually doing, the earnings of the miners would be correspondingly increased, and there would be no danger of a coal famine in January.

* * *

Improving the Coal Industry

SYNOPSIS—*Some of the suggestions made by "Coal Age" readers in answer to a \$10 prize offer for the best idea as to how to improve the paper itself, and a further \$10 prize for the best suggestion relative to the improvement of the coal industry. The letter written by W. H. Noone, of Thomas, W. Va., is awarded the \$10 offered for the best letter designed to improve the industry, while J. V. Freeman, of Joliet, Ill., wins the \$10 award for the best suggestion or idea for the improvement of "Coal Age." Further announcements concerning this contest will be made next week.*

In response to our recent invitation for ideas of a practical nature that would be beneficial to coal mining, the following are a few of the answers that came in, and they are here published in the hope that some real good may result from their discussion and adaptation whenever and wherever the suggestions are deemed useful.

Several hundred letters were received, and it required much time to pick from the whole lot the ones here published. Some of the answers were carefully prepared but they ran from 500 to 1,000 words in length and, therefore, could not be considered. Ever so many of the suggestions were wholly impractical, while others plainly violated present Federal laws. Seventy-five per cent. of the answers had one object in view—an increase in the price of coal. Six or eight of the letters published below are so nearly equal in merit that it has been difficult to select one as being best. However, Mr. Noone's letter comes within the 100-word limit and aside from its merit complies with the requirements of the competition. *Coal Age* particularly invites its readers to discuss any and all of the suggestions.

Melvin G. Lathrop, Mount Vernon, N. Y.—Let the refuse from the jigs and pickers go directly to the dump instead of to the bone-rolls to be ground down into steam sizes. Most anthracite steam coal is already dis-

trictly high in ash, with a deficiency in heat value that makes its users easy converts to bituminous. An increasing tonnage of coal is sold under specifications, and if the output can be prepared to earn a bonus for the merchant, a bonus can be demanded by the operator.

C. J. Adams, Superintendent Madeira-Hill-Clark Coal Co., Wilsonburg, W. Va.—Get rid of the coal operators who insist on running their mines regardless of the price of coal in the market. No company can run a mine and comply with the laws of West Virginia and keep its property up for less than \$1.25 per ton.

Thomas A. Evans, Plymouth, Penn.—I would first offer a criticism on the hiring of employees. A man will apply for a job as miner. The foreman will answer, "Sure, bring your tools and your miner's certificate around tomorrow." The certificate is easily secured by answering a few stereotyped safety questions. Why should not all the large coal corporations have employment bureaus in charge of experts who know just what questions to ask the man applying for the job?

N. H. Seaburg, Boston, Mass.—The coal industry is more deficient in the matter of labor than in anything else. It fluctuates—scarce at one time and overabundant at another. This could be remedied by the establishment of a Federal labor bureau, working in co-operation with employers of all trades. This would benefit all parties concerned. Such a labor bureau would be of the utmost importance at the present time.

W. E. Joyce, Sandy Run, Penn.—Improvement of the anthracite coal trade would doubtless follow a more extensive application of the policy of concentration of the several departments, which is recognized by some companies, immense sums being spent in putting it into practice in one department—mining. The three divisions—sales, land and mining—are in better accord today than ever before. An abnormal tax increase this year is forcing the attention of mining heads to a closer scrutiny of physical conditions of the land division; lack of enterprise in the sales division has already elicited pertinent comment. To get a more equitable tax levy, a

scheme can be devised by use of a small part of the ingenuity heretofore exclusively devoted to the mining division, and it is an absolute certainty that equally beneficial results would follow a similar application in the sales division.

George H. Lantz, New Straitsville, Ohio.—Form an organization in the various mining districts or states representing the Miners' Union, operators' associations and retail associations; the object of such a body to be the study and discussion of the relation of the coal industry to other industries, and the relation of various elements composing the mining industry to one another. Discussion would be held at the meeting place and by mail, after the manner of certain English institutes.

C. S. Schwartz, Blairsville, Penn.—Decline to recognize or deal with the Union (collective bargaining) until the strike clause has been eliminated from their bylaws or regulations; in other words, make the mines absolutely nonunion until such time as the men would discard sympathetic strikes, button strikes and the like, and also agree to abide by the agreements made by their accredited officers or delegates. Introduce the bonus system to encourage greater effort. Make the miners' houses and surroundings pleasanter, in order to attract American labor, doing away, as much as possible, with the drunken and riotous element.

Robert White, Belleville, Ill.—Suggest that every coal company make out daily cost sheets, comparing them at the end of each month and again at the end of each year to find out the cost of operation, add to this a reasonable amount for profit and depreciation and make this the selling price of the output. Don't load coal without an order, as railroads make the operator ship his coal or pay demurrage, leaving him to sell his product for what he can get for it or pay the railroad demurrage.

A. A. Liggett, Cincinnati, Ohio.—As a joint suggestion for the improvement of *Coal Age* and the betterment of the coal industry I recommend a coal industry conservation department, with the idea in view of laying these and kindred questions before the coal-mining public in some sort of manner whereby the facts may be absorbed without the necessity of those interested having a technical coal education. The specific ground to be covered by this proposed department need not interfere with other departments already created efficiently.

A Mine Inspector of West Virginia.—Make the mining men of the country realize their personal responsibility to their brothers in the mining game. Get the state mine inspectors, managers of coal companies, consulting engineers and other leaders in the mining world away from selfishness; away from the idea of hoarding information they have that would mean the saving of many lives, reputation for many mining men and profits for the coal companies.

Robert J. Lee, Elcan, Alberta, Canada.—Mines should ship their coal to the nearest market so as not to cross each other, and thereby save freight rates. The mines in the interior of the country could supply the interior and the mines near the coast the seaboard trade. The present time would be most opportune to build up a good trade with the Southern republics and other countries that must buy coal.

Bernard Canfield, The Crow's Nest Pass Coal Co., Coal Creek, B. C.—Would suggest there ought to be more harmony among the owners and officials of coal companies.

This could be brought about by the formation of local or district mining institutes or societies, regular meetings could be held and mining matters of interest discussed; members could state difficulties met with in their various departments, telling how they overcame them, or seek advice from others who have had similar experiences. Discuss advisability of standardizing mining equipment in the various districts where there is some similarity of conditions prevailing; also best methods of safety-first movement, each mine representative telling what he is doing to prevent accidents, etc.

Samuel Dean, Delagua, Colo.—One of the reasons why the coal industry is in its present condition is because very few suggestions for its improvement ever come from a mine owner. The great canards, the Coal Trust and the Coal Baron are seldom denied. More organization and coöperation is required in the sales departments. Organization does not mean the shifting of great sacrifices onto the shoulders of somebody else. Follow the methods of operators in South Africa. Remove all opposing factors. No interstate efforts have yet been made to improve the coal-mining business. We need national laws making safety standardization compulsory.

A. W. Spaht, Electrical Engineer, Christopher Coal Mining Co., Christopher, Ill.—There should be closer coöperation between the coal operators and dealers. The sizing and preparation in the different fields should be standardized so that when it becomes unprofitable to operate a certain colliery the customers could be supplied from a neighboring mine. There should be frequent conferences or meetings of officials to freely discuss the needs of the industry. They should read the papers, magazines (and the mine-workers' journals) relating to the industry, to broaden their views and to profit by the experience of others. In short, they should quit cutting one another's throats and coöperate.

H. L. Snyder, Assistant Treasurer and Sales Agent, American Coal Mining Co., Indianapolis, Ind.—The coal industry must be taken over by consolidation and regulated in such a manner that we will not have six mines where there is only business for one. There should be a Federal law that will regulate this.

A. A. McDonald, Monongahela City, Penn.—To my definite knowledge one large coal company has a record of 95 per cent. coal recovered. Other companies in the same region show a recovery as low as 63 per cent.; that is, 32 per cent. of the coal is lost forever. A national law, if enforced, regulating the minimum allowable percentage of recovery would treat all companies alike and would be a hardship to none. Also a national law prohibiting the future building of other than byproduct coke ovens would not prove a hardship to anyone. The present generation owe it to themselves and their posterity that the awful waste in the coal industry must stop.

T. A. Mitchell, Hardy, Ky.—On account of the rapid increase in the machinery being used in coal-mining each year it would be beneficial to the industry if men handling the machinery would be required to prove their ability either by an examination or by serving a specified apprenticeship. By following this plan only competent men would have charge of the mine machinery. Railroads follow this policy—why not coal operators?

Pennsylvania Inspector.—Every mine should employ a sufficient number of competent men to insure regular and frequent examinations of the roof, timber and haulage

equipment. In 1914, 61.5 per cent. of the fatal accidents in Pennsylvania mines was caused by falls of coal, slate and roof, and 24.03 per cent. by mine cars. The "Tables of Honor" in the yearly reports would contain many more names if the above suggestion were adopted and followed carefully. If each safety inspector working for a coal company were to prevent one accident each year the plan here suggested would prove a paying investment, particularly since the passage of the compensation act.

Samuel B. Creveling, Jedd, Penn.—Would suggest that a commission be appointed by the President of the United States, whose duties would run along the same lines as those of the Interstate Commerce Commission. This body would determine the selling price of coals for the various mining sections of the United States, so that a fair profit would be made on each and every ton mined. Would suggest that *Coal Age* ask its readers to discuss this.

William Crooks, Kimberly, Ala.—Establish a selling bureau to which all operators will turn over their production. The bureau will sell and pay for coal on a B.t.u. basis and will be insured a specified yearly output. It will be composed—or should—of men expert in the knowledge of transportation and fuel values. It should be created and maintained by the operators themselves. A bureau of this kind would regulate production and would consequently help to eliminate the cycles of depression, which are grave evidences of the chaotic conditions obtaining at present. This would not violate any antitrust law, as each operation would maintain its individuality.

P. L. Mathews, Superintendent Santo Tomas Coal Co., Santo Tomas, Tex.—The greatest need in the coal industry today is a national governmental (not political) commission, with substate commissions which would first inventory the coal resources of the nation and then regulate the coal output so that conservation would be an absolute necessity. The power of this commission should be extended over prices and distribution in such a manner that thin seam coal could successfully compete with the rich veins and a prohibitive premium put on the wasteful methods which are often unprofitably devastating our rich coal fields through practices based on unscientific distribution.

W. H. Noone, Thomas, W. Va.—Why not a bonus to employees? Such a plan has been successfully established in other industrial fields and has survived the experimental stage. A bonus system might be inaugurated in coal mining on the principle of eliminating the waste of time, labor and material, which at present appears to be very great. The monetary value of the bonus should be graduated according to the actual merit and efficiency of the service rendered by employees. If such a plan did no more than offset the dollars saved in time and material, it would be a success.

W. Zuendorff, Superintendent, Van Lear, Ky.—Fight the waste of labor. Every additional man that a coal company employs is an additional factor of waste in time and supplies. Therefore, it is best to work with the least possible number but highest class and highest priced men that can be procured. It is likewise necessary to fight the waste of material. A drop of oil here, half a dozen spikes there and a pound of copper at another place mean a loss in money. Tom Jones gets posts that are several feet too long, which is another considerable waste. Forgotten track in aircourses is likewise a dead loss. All these

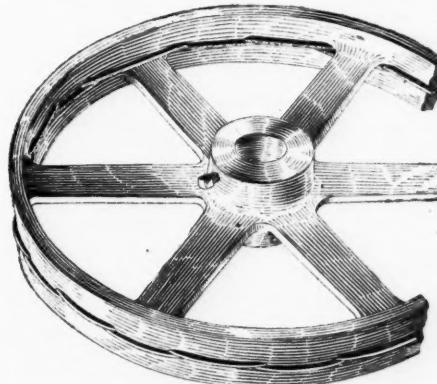
things are burdens on the industry. Educate yourself and your men to avoid waste.

C. B. Stewart, Superintendent the Wright Coal and Coke Co., Wright, W. Va.—I suggest that coal operators, managers and superintendents in the different states organize in a single substantial body. Then divide each state into districts so that managers and superintendents working in each of these districts could meet once a month and select the best men to represent them at a state meeting. This latter meeting could take place every six months, and the delegates to the state meeting could appoint several of their number to represent them at a national meeting, which should occur annually. The definite purpose of all this should be to improve the coal industry by regulating, so far as possible, the price of coal through the dissemination of real information and a consequent closer coöperation.

Neill Hutchings, Tennessee Coal, Iron and Railroad Co., Birmingham, Ala.—I suggest employment on the basis of mutual consideration. Capital invested in the mining industry must be managed to serve three masters: (1) Stockholders; (2) employees; (3) customers. Labor as represented by the workmen is interested in: (1) The existence and earnings of self; (2) support and happiness of dependents. All differences between management and workmen begin with employment. Mutuality of relation necessarily follows, its nature depending on the character of managements and men. Therefore give the employment of bosses and workmen greater care and consideration than is bestowed on plant equipment. Establish an employment and mutuality bureau at the same time removing the business of hiring, handling and firing employees out of the individual's hands. Earnest effort in this direction will solve many problems in the industry.

An Improvised Crown on a Flat Pulley

This simple and effective method, says Arthur Birmingham in *Power*, was devised for keeping a high-speed belt on a large-diameter iron split pulley driven from a motor. Owing to both pulleys being flat, consid-



AN IMPROVISED CROWN ON A FLAT PULLEY

erable difficulty was experienced in keeping the belt in the center of the pulleys. In the large pulley $\frac{1}{2}$ -in. holes were drilled between each pair of spokes and in the center of the face of the pulley. Two belt laces were then threaded on alternate sides of the rim, forming a false crown, as shown in the accompanying illustration.

The Labor Situation

General Labor Review

Settlement of the Cranberry strike near Hazleton, Penn., has not yet been attained, although an effort has been made to have the men return to work. They are determined, however, that the few men who have remained out of the organization at the mine either join or leave the colliery.

In the mean time the officials of the company are proceeding with their plans for repairs to the plant. The strike is not causing any inconvenience in that quarter and should the men vote to return to work there is likelihood of a "no work until further orders" notice being posted as the breaker repairs will be started shortly.

Demanding a reduction in working time from ten to nine hours, and being met with refusal, laborers employed by Burke Bros., on stripping operations for the Delaware and Hudson Coal Co., on Sept. 15, declared a strike. The men had been at work on the operations for two weeks.

The men on strike at the No. 10 colliery of the Lehigh Coal and Navigation Co., to the number of 800, have returned to work on instructions from the union officials, who have arranged with the company to arbitrate the question at issue. The men have been out for two weeks.

Quelling Disorder at Old Forge

Vigorous exercise of police powers has resulted in breaking the strike of the Industrial Workers of the World which has been in force in Northern Luzerne and Southern Lackawanna counties of Pennsylvania since Aug. 29. The strike was called in sympathy with the suspension of Minnesota iron miners, whose strike has been called off. The anthracite trouble continued, for no apparent reason, for a week after the original cause ceased to exist.

Picketing and attacks on miners marked the early days of the strike, but large forces of sheriffs' deputies and 50 members of Troop B, state police, broke up the open violence and protected men desiring to go to work. Stealthy methods of intimidation were resorted to by strike sympathizers and the homes of four miners in Pittston and its vicinity have been dynamited. Sending of threats by mail, the placing of crepe on miners' homes and other methods of intimidation were tried.

The strike was at its worst on Sept. 5, when only half the mine workers from Old Forge to Plains were at work. With the absence of picketing, the miners who had been idle through fear gradually returned, until the working force is approaching normal.

On Sept. 15 the home of Michael Loughney, a Pittston miner who had refused to quit work, was dynamited. Loughney and his wife were hurled from their bed and fell through the torn flooring to the cellar, both being injured. On Sept. 17, the house of Frank Quartain, of Pittston, was also dynamited. No arrests have been made in either case. The city of Pittston and the county of Luzerne have each offered \$1,000 reward for the conviction of the dynamiters.

The sheriffs and police authorities exercised every power to prevent disorder. They first broke up picketing and open violence. On Sept. 11, meetings of the Industrial Workers were forbidden in Luzerne and Lackawanna counties. On Sept. 12, Sheriff Buss raided a meeting at Dupont and captured five alleged ringleaders. On Sept. 14, the state police made the most spectacular round-up in the history of the commonwealth, arresting 262 men in attendance at an I. W. W. meeting in Old Forge. Police methods were supported by the minor judiciary, the bail in all cases being fixed at almost prohibitive figures. Practically every man arrested is still in jail awaiting trial. Unlawful assembly and inciting to riot are the usual charges. In all, 326 arrests have been made in the strike district since Aug. 29. None of the leading officials of the Industrial Workers have ventured there.

An immediate effect of the strike will be a shortage of labor in the district affected. Mine workers, fearing to work in the face of threats and violence, have fled the region for commercial centers where better wages and peace await them. It is estimated that 700 men have left Pittston and its vicinity since the strike began. This is a conservative estimate, based on railroad figures. Most of these men go to Detroit, Rochester, or the munition-making centers. Formerly in strike times, the anthracite miner settled down until it blew over. That day is past, due to the attractive wages for laborers in industrial centers.

Because there seemed no other protection from dynamiting and secret violence, 700 men of the Cork Lane and Brownstown districts of Pittston Township met on Sept. 18 and organized a vigilance association and provided a volunteer policing of the neighborhoods. Twenty-four men do nightly patrol duty. Ominous earnestness marked the meeting. The sheriff invited other towns to follow suit. There is intense sympathy with the police measures in the region affected.

So far as the strike is concerned, it is over. There can be no picketing and anyone who wants to work, can work. Some of the more rabid strikers are holding out, but they are bound to return in time. The worst effect of the strike on the region is the exodus of the hundreds of miners who have left in the three weeks it lasted. Coal production has been seriously curtailed.

Conditions Are Unchanged in Western Pennsylvania

Labor conditions in Somerset County, Penn., are unchanged since last week and the United Mine Workers do not seem to be increasing their organization efforts. The Knickerbocker operations and Baker-Whiteley Coal Co. at Hooversville are still gradually increasing their output, as is the Stauffer-Quemahoning Coal Co. at Listie. The J. Blair Kanerly mine at Pretoria, near Holsopple, is still idle, as are the mines of the Hocking Coal Co. at Garrett and those of J. O. Ream at Berlin, both in the southern part of the county.

The Pioneer mine of the North Jellico Coal Co., near Pineville, Ky., is resuming operations at the old scale, after a suspension since July when the miners struck for advances. Two hundred men are employed. The company officials made the statement that the mine would remain closed, rather than grant the demands of the miners. Charles D. Major, secretary and treasurer of this firm has stated that the company would not consent to a repetition of conditions such as have developed in western Kentucky, where the same interests operate mines. It would have been impossible, he said, to have granted the demands of the men and to continue operating the Pioneer mine at a profit.

Five hundred miners employed at the Royal Collieries at Virden, Ill., operated by the Chicago, Wilmington & Franklin Coal Co., went on strike Tuesday, Sept. 12, to enforce a demand for \$6,672.68 which they allege has been withheld from them by short weight during the past six months. President Frank Farrington of the United Mine Workers of Illinois and President C. M. Modenwell, of the Illinois Mine Operators' Association have taken charge of the situation and are trying to effect a settlement.

The Oklahoma Coal Operators Association has established headquarters at McAlester in the Busby Hotel, with D. J. Jordan, of Oklahoma City as president and Frank B. Drew, of McAlester as secretary-treasurer. This association was organized from those operators who withdrew from the Southwestern Interstate Coal Operators' Association in the wage conferences which have been held at Kansas City. The operators have agreed to advance the wages of the coal miners and renew the present contract with the wage increase included for another two years. If the miners desire other changes in the contract, the operators have agreed to discuss the matter with a view to reaching an agreement.

The refusal of the coal operators of the State of Washington to meet the wage increases demanded by the local council of the United Mine Workers of America has threatened a serious break between the two and it is expected that a strike will be called on Oct. 1.

In refusing the demands recently made by the miners the operators advance many important reasons, chief of which are the competition of other fuels and of coal from adjoining states or from across the Canadian border, and the greatly increased cost of supplies.

In the face of these adverse conditions and the fact that Washington coal operators are now paying the highest wage scale with one exception that exists anywhere in North America they have offered the miners organization increases in practically every department of from 4 to 18 per cent. In other words all wages under \$3.80 have been increased materially. Despite the conditions facing the coal operators and the liberal increases offered the miners have practically decided to walk out unless their scale as adopted by them is accepted.

Editorials

Coal-Mining Examinations

One of the subjects being discussed in *Coal Age* at present is the character of examinations given candidates for the positions of mine foremen, assistant mine foremen and firebosses. All will agree that this examination should be very practical. We do not mean by this that technical questions should be eliminated from the examination, but that such questions should be asked as will best demonstrate the candidate's capability for filling the position desired.

This at once suggests the inquiry, What are the requirements that will show a candidate's capability to fill a position? The answer is, He must be able to perform the duties that pertain to the office with a reasonable efficiency in respect to safety and economy of operation.

This presents a broad field, preparation for which must include a practical knowledge of and experience in all the various details of mining work, combined with a technical knowledge of the principles relating to the mining of coal in its various phases. This will include the principles of mine ventilation, atmospheric or barometric pressure, humidity of air, nature and behavior of mine gases, effect of coal dust suspended in air, causes and effects of ignition of gas and dust, nature of different explosives, geological conditions, character of the coal formations, effect of faults and slips in the strata, pressure and emission of occluded gas, principles of timbering, the adaptation of different methods of working to different conditions, principles of drainage and pumping and a knowledge of the various systems of mine haulage, electricity and different kinds of electrical equipment, besides a certain knowledge of anatomy that will enable a man to render first-aid assistance in time of need, also a knowledge of surveying that will enable him to read mine plans intelligently.

This is only a brief outline of the technical knowledge a candidate for mine foremanship should possess. In addition to this and his practical experience and knowledge of mining, a candidate's capability to fill an official position is determined by what has been styled his "personal equations"—that is to say, his ability to quickly grasp the important features of a situation and to act promptly in an emergency. A candidate's competency will also depend on his temperate habits, honesty and industry, all of which should be vouched for by proper indorsement.

In criticising the character of the questions asked at different state examinations, one should remember that the written examination of a candidate rightly partakes very much of the nature of a school examination, its purpose being to ascertain the technical knowledge of the candidate, as well as his practical knowledge of mining operations and mine equipment, covering the various branches of the subject we have mentioned.

It is foolish to expect a candidate for a practical position to memorize formulas and constants so that he will have them at his fingers' ends. The time would be lost

to the candidate in such a preparation for examination. Instead, he should be able to use a textbook or handbook so as to work out correctly and promptly any technical questions that may be given by the board pertaining to his particular work. As we have claimed for many years, examining boards that wish to be honest and fair in their dealing with candidates will examine them on this basis and give them the same opportunities that they would possess in dealing with such questions in practice, in the office or at home.

Coal Age does not wonder that examining boards are being severely criticised today for the manner of conducting their examinations and the style of questions asked. In regard to the kind of questions, however, it cannot be claimed that questions on ventilation, mining chemistry, principles of mechanics, etc., are "obsolete." Although these questions were asked 20 years ago, the same principles apply in coal mining today and are properly asked as a part of the examination.

We wish to indorse the action of the examining board of the 17th bituminous district of Pennsylvania, in substituting for the oral examination of candidates the practical examination of a mine. The results obtained thereby have an untold value, and as far as practicable, the same methods should be adopted by examining boards everywhere. In this connection, we would draw attention, also, to the need of firebosses passing a so-called "sight-test" in the detection of gas with a safety lamp. We understand this method has been used by examining boards in British Columbia and elsewhere with good success. The detection of gas by the fireboss is one of his most important duties, and it is essential to ascertain the ability of such a candidate to test for gas correctly.

* * *

Studies in Economic Dynamics

When we hire a man to run a pump or a hoisting engine we expect he will have some elementary ideas of mechanics which he has learned somewhere, partly from experience, partly out of books and partly from instructors. The manufacturer who constructed the pump or the engine has made it practically impossible for anyone to let steam in on both sides of the piston at the same time.

But if we engaged a man to run the machinery, and he thought that there should be equal steam pressure on both sides of the piston in order that the parts might be put in motion, then we would suspect that, being so little acquainted with matters of common knowledge and judgment, he would be entirely unable to understand the intricacies of the plant over which he had control, and we would dispense with his services.

Now in economics, the workingman really does believe that he can move more effectually up the social scale if he is pressed upward by higher wages, even if at the same time he is pressed downward equally by having to pay more wages to others for the services which indirectly—through employers of labor—he must buy of

them. He believes that he will progress more rapidly if his wage getting and his wage paying are both increased. He hopes that if his wages are raised, and also those of the men he hires, he will attain a better economic position.

When the transport worker strikes to get more for his services, the miner wishes him success as if he does not have to pay the man for his work. He glories, he says, in his power "to put it over." Just as well might a man in a long queue at the window of a failing bank rejoice when one who arrives late elbows himself to a point right opposite the teller regardless of his turn.

Some day the workingman will understand that wage increases act on a man like steam on a piston. Let them come equally on all sides and there is no progress for him. The gain of one is the loss of another, and everyone remains where he was. As long as steam is on both sides of a piston there is no progress, no matter what the pressure may be. As long as the workingman must pay as well as receive wages, there is nothing to be gained by a uniform increase of wage.

If economic dynamics were as freely taught as the dynamics of machinery, some grossly fallacious ideas would cease to actuate mankind. It would be well worth while if operators would spend some time in studying economic dynamics and how it may be put in everyday speech. They would do well if they would then use these arguments on occasion: for surely the workman can reason out the science of human relations as logically as he can the operation of steam in a cylinder.

X

Is the Heat-Unit System Doomed?

Exponents of the heat-unit system of coal purchasing have proved so often and so conclusively the benefits accruing from that method of buying, that it has been exceedingly difficult to find a reasonable explanation why it is not more generally adopted. The explanation undoubtedly lies in the fact that coal purchases have become a mere matter of custom.

Interlocking business or financial interests are frequently the determining factor; or, it may be a mere matter of friendship, or the trade name, with which the consumer has always found satisfaction. Custom in the final analysis is the most potent influence, since it guarantees satisfaction supplemented by conservatism. It must also be conceded that the difference in the same general grades of coal, as viewed by the average consumer, is too infinitesimal to justify any elaborate investigation.

It is not unreasonable to expect, therefore, that some nation-wide revolution, either in the fuel industry itself or among the industrial consumers, will be necessary to cause any general adoption of the heat-unit method of buying. Such indeed was the case in South Africa. At one time competition developed to such proportions that the operating companies were all threatened with financial disaster, which ultimately forced them to combine and form a sales organization to handle their entire product. The first problem that faced the selling organization was the fixing of an equitable price on the various grades they handled. Obviously, there was only one basis on which all the interests concerned would be willing to agree, with the result that the heat-unit method of selling coal in that country has now become the accepted practice.

Permanency of Our Export Trade

Foreign consumers who have given American coal a fair trial, admit that it is equal to the best Welsh product. We therefore have nothing to fear in regard to quality. In addition British coal exporters at the present time are only able to meet the requirements of their allies, and little tonnage is available for shipment to neutral markets.

A glance at the following figures of Hampton Roads exports for the month of August, during the past several years, shows how the present shortage of British coal has increased our exports:

Year	Tons	Year	Tons
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1910	154,789	1914	295,552
1911	218,649	1915	609,506
1912	158,764	1916	596,450

The last week in August of this year, British exports were 240,000 tons, as compared with 349,000 the previous week and 340,000 the corresponding week of 1915. Of the 240,000 tons exported only 15,000, or about 6 per cent., went to neutral countries.

Prices for Welsh coal are at present about \$11.50 per ton as compared with \$3.50 for American coal of the same quality. The freight rate from Cardiff to the River Plate is about \$8 and from Hampton Roads about \$15. This will make the delivered price of Welsh coal \$19.50 and American coal \$18.50. Our coal, therefore, has a slight advantage even when Welsh coal is available.

The British Government has now decided to limit the price of coal and rate of freight to Italy, Portugal and Spain, the arrangement being similar to that in operation with France. This limitation will work out about as follows:

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Barcelona	7.50	15.75	23.25
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AMERICAN COAL			
Port	Coal	Freight	Price
Genoa	\$3.50	\$28.00	\$31.50
Barcelona	3.50	23.00	26.50
Lisbon	3.50	19.50	23.00

Of course we cannot expect that our heavy exports will continue after the war, when conditions are again normal. There is no doubt, however, that a large portion of our foreign trade will be retained, and this tonnage should be steadily increased. South America is the logical market for our exporters, but in the past they have been heavily handicapped for the following reasons: The largest consumers of coal, the railroads and public service corporations, are practically controlled by British and European capital; lack of American vessels suitable for the foreign trade; no American banks, thereby subjecting the details of our business to banks more or less affiliated with our competitors.

This latter condition does not now exist, as several of our larger financial institutions have established branches in South America, where they are rendering invaluable aid to our exporters. Our merchant marine is also rapidly increasing, and in a short time will be of respectable size. In addition, the production per man of the British miner is much below that of the American, while other costs of mining are steadily increasing in Great Britain. And finally, our facilities for loading export coal exceed by far those of any other country in the world.

Discussion by Readers

Merit vs. Favoritism in Gaining Promotion in Mining

Letter No. 5—The only men who get real interest out of life are those who invest 100 per cent. of themselves in their daily living. Opportunity belongs to no time or place. The man who waits for something to turn up, like Dickens' Micawber, will wait a long time for his expectation to be realized.

There is always an opening somewhere for the man who is ready for what comes, but the man whose self-regard exceeds the estimation in which he is held by others will generally find the "door of opportunity" too narrow for him to enter. As an employee, he possesses no merit that recommends him for promotion. He is a hindrance to the work in hand, because of his overbearing ways. In an official position he betrays his weakness by the manner in which he displays his authority.

The man who is not accustomed to the use of power invariably abuses it. He is a source of annoyance to all with whom he has to do. He considers himself important, because of the opportunity offered by reason of his position to annoy important people. He does not realize that a gnat can do the same, or a rusty hinge, a creaking door or rattling window.

If you are this sort of individual, depend upon it you are a failure and have yet to find it out. Realizing that you lack the brains of another, you attempt to supply that deficiency by a display of bluff, which shows others that you have reached your level. Commonsense and ability in a man make him courteous, obliging and patient. They are the qualities that stamp a man as a success in any calling.

The goodwill of others is one of the chief assets in business. The man who seeks every occasion to gain well-wishers for himself strengthens his employer's business and puts himself in line for promotion. No employer has room for a self-important and surly employee. Therefore, exercise your smile muscles. Grin and win. Remember that good nature is a time-saver, while a grouch hinders progress. Headquarters is sure to hear the creak in the industrial machine and little time is lost in locating the source of the trouble.

The more one analyzes the essentials to success, the more he realizes that tact, good judgment and a sunny temper will give him a passkey to every door in the organization with which he is connected. These qualities in a man will go far to offset the ill-effects of favoritism in the management, and in the end true merit will win.

Study to know yourself. Listen patiently to the complaints and criticisms of others. They will indicate to you your weak points. To be sure, a "kick" may come from a crank, but you have much to gain and nothing to lose by giving it the consideration it deserves, and by so doing you may gain a friend. Every ill-wisher is a hostile force—an active microbe infecting the confidence of friends. Live in the sunshine. A pleasant railway journey begins with the gatekeeper's smile. An enjoyable din-

ner is insured by an obliging, attentive waiter—a satisfactory purchase, by a courteous floorwalker. On the other hand, corporations groan under the load of deficits occasioned by stupid and surly employees. A row at the box office or a discourteous usher will spoil a good show.

Plymouth, Penn.

C. E. H.

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Coal Mining, Politics and Labor

Letter No. 3—In the foreword of Carl Scholz, *Coal Age*, Aug. 5, p. 211, some statements appear that I believe, under the analysis of an unprejudiced discussion, will prove to be problematical, if not wholly erroneous.

The first statement Mr. Scholz makes, after assuming that party differences are eliminated from the present campaign for president, reads as follows: "The party now in power has evidently recognized that . . . a protective tariff is an absolute necessity for the survival of our industries." I question the truth of this statement, in its general application to the reasoning portion of American voters.

There was undoubtedly a time, when our industries were in their infancy, that a protective tariff was required for their nourishment and growth. At the present time, I agree with Samuel G. Blythe, who, writing in the *Saturday Evening Post*, describes a protective tariff as "a slogan long since deprived of its industrial potency." How many wage earners of this country have been able to see any economic value of such a tariff in the present strife between employer and employed.

PRACTICAL EFFECT OF A HIGH TARIFF

The argument is advanced that a high tariff protects the home market from an influx of foreign products. Instead, however, its chief object is to enable American goods to be sold at any price the trusts and combines may decree, while the same goods exported to foreign markets are sold at greatly reduced prices where they are in competition with cheap labor.

It was this condition that made necessary the Sherman bill, restricting combinations of capital in restraint of trade. In truth, a protective tariff is the mother of trusts that are responsible for the high price of living. Much more needful is it that the wage earner in this country should be protected against the influx of cheap foreign labor that threatens seriously his earning capacity in the support of his family.

Again, Mr. Scholz laments that "the average American business man does not take much interest in politics." Can he deny that the policy of large business interests is to see that the political pack runs true to scent? An invisible government resides in industrial supremacy, not in organized labor the influence of which is small compared to that of vested money interests. Where is the "democracy" that Mr. Scholz rightly says "is needed in the conduct of world affairs?" Who, may I ask, possesses the true idea of what constitutes democracy? Is it to be

them. He believes that he will progress more rapidly if his wage getting and his wage paying are both increased. He hopes that if his wages are raised, and also those of the men he hires, he will attain a better economic position.

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Of course we cannot expect that our heavy exports will continue after the war, when conditions are again normal. There is no doubt, however, that a large portion of our foreign trade will be retained, and this tonnage should be steadily increased. South America is the logical market for our exporters, but in the past they have been heavily handicapped for the following reasons: The largest consumers of coal, the railroads and public service corporations, are practically controlled by British and European capital; lack of American vessels suitable for the foreign trade; no American banks, thereby subjecting the details of our business to banks more or less affiliated with our competitors.

This latter condition does not now exist, as several of our larger financial institutions have established branches in South America, where they are rendering invaluable aid to our exporters. Our merchant marine is also rapidly increasing, and in a short time will be of respectable size. In addition, the production per man of the British miner is much below that of the American, while other costs of mining are steadily increasing in Great Britain. And finally, our facilities for loading export coal exceed by far those of any other country in the world.

Discussion by Readers

Merit vs. Favoritism in Gaining Promotion in Mining

Letter No. 5—The only men who get real interest out of life are those who invest 100 per cent. of themselves in their daily living. Opportunity belongs to no time or place. The man who waits for something to turn up, like Dickens' Micawber, will wait a long time for his expectation to be realized.

There is always an opening somewhere for the man who is ready for what comes, but the man whose self-regard exceeds the estimation in which he is held by others will generally find the "door of opportunity" too narrow for him to enter. As an employee, he possesses no merit that recommends him for promotion. He is a hindrance to the work in hand, because of his overbearing ways. In an official position he betrays his weakness by the manner in which he displays his authority.

The man who is not accustomed to the use of power invariably abuses it. He is a source of annoyance to all with whom he has to do. He considers himself important, because of the opportunity offered by reason of his position to annoy important people. He does not realize that a gnat can do the same, or a rusty hinge, a creaking door or rattling window.

If you are this sort of individual, depend upon it you are a failure and have yet to find it out. Realizing that you lack the brains of another, you attempt to supply that deficiency by a display of bluff, which shows others that you have reached your level. Commonsense and ability in a man make him courteous, obliging and patient. They are the qualities that stamp a man as a success in any calling.

The goodwill of others is one of the chief assets in business. The man who seeks every occasion to gain well-wishers for himself strengthens his employer's business and puts himself in line for promotion. No employer has room for a self-important and surly employee. Therefore, exercise your smile muscles. Grin and win. Remember that good nature is a time-saver, while a grouch binders progress. Headquarters is sure to hear the creak in the industrial machine and little time is lost in locating the source of the trouble.

The more one analyzes the essentials to success, the more he realizes that tact, good judgment and a sunny temper will give him a passkey to every door in the organization with which he is connected. These qualities in a man will go far to offset the ill-effects of favoritism in the management, and in the end true merit will win.

Study to know yourself. Listen patiently to the complaints and criticisms of others. They will indicate to you your weak points. To be sure, a "kick" may come from a crank, but you have much to gain and nothing to lose by giving it the consideration it deserves, and by so doing you may gain a friend. Every ill-wisher is a hostile force—an active microbe infecting the confidence of friends. Live in the sunshine. A pleasant railway journey begins with the gateman's smile. An enjoyable din-

ner is insured by an obliging, attentive waiter—a satisfactory purchase, by a courteous floorwalker. On the other hand, corporations groan under the load of deficits occasioned by stupid and surly employees. A row at the box office or a discourteous usher will spoil a good show.

Plymouth, Penn.

C. E. H.

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Coal Mining, Politics and Labor

Letter No. 3—In the foreword of Carl Scholz, *Coal Age*, Aug. 5, p. 211, some statements appear that I believe, under the analysis of an unprejudiced discussion, will prove to be problematical, if not wholly erroneous.

The first statement Mr. Scholz makes, after assuming that party differences are eliminated from the present campaign for president, reads as follows: "The party now in power has evidently recognized that . . . a protective tariff is an absolute necessity for the survival of our industries." I question the truth of this statement, in its general application to the reasoning portion of American voters.

There was undoubtedly a time, when our industries were in their infancy, that a protective tariff was required for their nourishment and growth. At the present time, I agree with Samuel G. Blythe, who, writing in the *Saturday Evening Post*, describes a protective tariff as "a slogan long since deprived of its industrial potency." How many wage earners of this country have been able to see any economic value of such a tariff in the present strife between employer and employed.

PRACTICAL EFFECT OF A HIGH TARIFF

The argument is advanced that a high tariff protects the home market from an influx of foreign products. Instead, however, its chief object is to enable American goods to be sold at any price the trusts and combines may decree, while the same goods exported to foreign markets are sold at greatly reduced prices where they are in competition with cheap labor.

It was this condition that made necessary the Sherman bill, restricting combinations of capital in restraint of trade. In truth, a protective tariff is the mother of trusts that are responsible for the high price of living. Much more needful is it that the wage earner in this country should be protected against the influx of cheap foreign labor that threatens seriously his earning capacity in the support of his family.

Again, Mr. Scholz laments that "the average American business man does not take much interest in politics." Can he deny that the policy of large business interests is to see that the political pack runs true to scent? An invisible government resides in industrial supremacy, not in organized labor the influence of which is small compared to that of vested money interests. Where is the "democracy" that Mr. Scholz rightly says "is needed in the conduct of world affairs?" Who, may I ask, possesses the true idea of what constitutes democracy? Is it to be

found in the greed of trusts and combines, or is it symbolized in the strife of labor for a living wage?

Again, Mr. Scholz says, "In this land of opportunity we all start with the same advantages." Granting that the prince and the pauper possess the same inherent qualities, let me ask, Do they possess equal opportunities? Individuality is truly an element of success, but no individuality of one can forge ahead in an environment that lacks the opportunities presented to another. The law of "demand and supply" suggested by Mr. Scholz in this connection, is evidence in itself that the supply of opportunities is greater to those favored by fortune, wealth and influence.

The statement, "Labor cannot exist without capital," is not true. While capital is a potential medium, labor is a natural power, which will continue to exist through its productive agency. Labor is a creative power, while capital is as dependent for its value as the hidden resources of nature that await development by the hand of labor.

In closing, let me say that capital and labor are natural partners in all our industries, and justice demands that each share equally in the profits and losses that attend the undertaking. The cause of labor has unquestionably been injured at times by so-called labor leaders who have assumed to represent the industrial classes. Such errors should not, however, be regarded as a criterion of the motives of the great mass of wage earners, who may err in judgment but not in sentiment.

The task of creating a democracy of labor is herculean. One error that has been made in this line is the frequent appeal to the emotional nature of workers, by a lurid description of supposed wrongs. The great mass of humanity have a clear idea of their wrongs, but very few have any idea of how those wrongs may be adjusted. The aim of true labor leaders should be to educate men in regard to the best methods to employ to overcome these evils. Labor leaders should cease to be agitators, arousing men too often to acts of mob violence.

Windber, Penn.

A. M. INER.

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Springs on Mine Locomotives

Letter No. 1—Referring to the inquiry of "Motorman," *Coal Age*, Sept. 9, p. 441, kindly permit me to add a little of my own experience in locomotive construction work, in addition to the answer given to this question.

I have always been an advocate of spring suspension, both for the motors and the sideframes of mine locomotives, having found that it gives greater flexibility to the machine. Spring suspension of the motors reduces the shock both on the gearing and the armature bearings, while spring suspension of the sideframes reduces the pounding on the rails that lowers the cost of track maintenance and necessary repairs on the locomotive. It is quite generally conceded that more than one half of track destruction is due to the heavy pounding of the locomotive.

Speaking of the greater tractive power of the 6-ton, single-type locomotive, as compared with the 7-ton, double-type machine, in this case, it is my opinion that it is due to the different construction of these two types of locomotives. In a single-type machine, the armature is geared to both axles, in which case all four wheels act jointly and present a unit of tractive effort, since no wheel can slip unless all the wheels slip, and the four wheels always revolve at the same speed.

Bearing this feature in mind, it is quite evident that a heavier trip of cars can be started and hauled by a single-type machine, than is possible in the double-type construction where the two axles are free to act independently. It would be contrary to all reason to ascribe the greater tractive power of this 6-ton machine to the fact that it was not mounted on springs. It is more reasonable to expect that its superior power is due to the greater adhesion to the rails, of the four wheels acting together as a unit.

Tests that have been made to ascertain the relative drawbar pull of these two types of construction have shown that the single-type is superior in this respect to the double-type machine. There is, apparently, a considerable difference between the total coefficients of adhesion of the two machines, the coupled axles of single-type electric locomotives always presenting a higher coefficient of adhesion of the wheels to the rails.

T. O. HUGHES,
Windber, Penn.
Mining Electrician.

An Efficient Coal Miner

Letter No. 4—I was glad to read Jacob Riley's letter, starting the discussion of the efficient coal miner, as I believe it is just as important for the miner to be efficient as it is to look for efficiency in the foreman and fireboss. I also believe that improvement must start on the outside of the mine with the higher officials, who can do very much to increase the efficiency of their men all down the line.

To be truly efficient, a miner must know more than just how to dig coal. He cannot do the best work and get the best results for himself and his employer unless he understands how to timber his place to make it safe and to drill and charge his holes for blasting down the coal. He must know what to do and what not to do and be well acquainted with the state mining laws and the mine rules for safety.

Methods of mining coal have been modernized, and in many mines the miner's pick is replaced with the coal-cutting machine. In order to keep pace with these changes, and to make the miner efficient in his work, he must be instructed along these lines. This duty falls on the mine foreman and his assistants, who should give every miner the instructions he needs in regard to blasting the coal, and see that his holes are properly located and drilled and that he knows how to insert the charge and tamp and fire the hole in the safest and best manner.

An efficient miner will understand clearly that any waste of coal or other material is a loss to him as well as to his employer and will ultimately mean lower wages. For the same reason, he will strive to avoid accidents by obeying the mining laws. There are many foreigners working in the mines today, and some of these cannot even speak or read English. To make them efficient workmen, they must be made to understand both the mining laws and the mine rules, which should be printed in their own language, in little pamphlets, and given to them. Meetings in which first-aid instruction is given will develop more careful miners.

It is needless to say that an efficient miner will not go to the saloon, but will let liquor alone and keep his head clear so that he can do the best work in the mine.

Peru, Ill.

GASTON LIBIEZ.

Coal Mining Examinations

Letter No. 1—I read with interest the article by Alexander Waugh, secretary of the Mine Foremen's Examining Board for the 17th bituminous district of Pennsylvania, *Coal Age*, Sept. 16, p. 461.

In his article Mr. Waugh outlines a practical method of conducting the oral examinations adopted in the last two years by his examining board. He states that the men examined for certificates of competency for the positions of mine foremen, assistant foremen and firebosses, in addition to their written examination, were sent into the Bruceton mine and asked to examine that mine for safety, in the same manner that they would when appointed to an official position.

The results obtained in this examination are astonishing in some respects and will serve to open the eyes of many members of examining boards, showing as they do how many men will fall down in a practical test who otherwise would pass a good examination.

A short time ago, two or three friends who met in an informal way were discussing the subject of mining examinations as they are conducted today. All agreed that the style of questions asked in the examination of mine foremen, assistant foremen and firebosses were not the kind of questions that are most needed at the present time, one man claiming that they were "old as the hills" and "obsolete."

The idea that found favor with all present was that the rapid strides made in the coal-mining industry in the past few years have entirely revolutionized mining methods; and that these changes in the manner of producing coal required a corresponding change in the style of questions asked in examinations. Instead, however, it was stated the same questions are being asked today that were used in examinations 15 or 20 years ago.

WHAT IS NEEDED TODAY IN MINING EXAMINATIONS

There is an old saying that is strikingly true in its application to examining boards; namely, "Old customs and habits die hard." What is particularly needed to meet present day requirements in this regard are questions that have a direct bearing on everyday difficulties that superintendents and mine foremen must overcome. This is quite clear when we consider the great difference in the daily output of the modern mine, as compared with mining operations 20 years ago. It seems absurd to expect that the questions asked in examinations at that time can apply to mines putting out from 3,000 to 4,000 tons per day, instead of 600 to 800 tons, as formerly.

It would be decidedly more to the point for candidates for mining positions to know what caused different mining machines to get out of order, than it would be to know which of the several coefficients of friction in ventilation is correct. It would be better for them to know under what conditions they can expect to obtain maximum results in the operation of mine locomotives, coal cutters and other mining equipment, than it would be for them to memorize and be able to spin off chemical compounds, atomic weights and other high-sounding phrases at the rate of so many hundred words per minute. Such data are learned by many students as a parrot learns its little rhyme.

Nothing much is gained by adhering to these old questions that are of little apparent use and have small

bearing on the problems with which mine officials must contend. Ask the average mine foreman today to answer one of the questions he answered when he took his examination a few years ago, and he will quickly reply that he has "forgotten all that stuff," which proves that he never made use of it in daily practice.

In my opinion the sane thing to do is for examining boards to discard many of the examination questions now being used in most of our coal-mining states, and in their place give questions that will be of service to the mine official in his future life and not serve the sole purpose of an examination for a certificate of competency. In talking over this subject we agreed that we would like to see the matter thoroughly discussed in *Coal Age*. The feeling was expressed that there are a great many to whom a discussion of this nature would prove interesting, instructive and of real value.

WILLIAM CROOKS.

Kimberly, Ala.

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Certification of Mine Foremen

Letter No. 4—My attention was arrested by the seeming belief of the writer of *Letter No. 3*, *Coal Age*, Sept. 2, p. 397, that the new law in Pennsylvania, which permits mine operators to employ uncertified men as mine foremen, will have no effect to debar certified men from the service.

In my opinion, this is a mistaken view of the situation. I know of some coal companies that have already taken advantage of the new law. In some instances they have reduced their mine foreman's wages, and where he has refused to work for the pay offered him, his place has been promptly filled by an uncertified man. In one instance in my knowledge a fireboss has been placed in charge of a mine, at a salary of \$75 a month. This man proved at the mine foreman's examination that he was incapable of holding a foreman's position and was refused a certificate by the board. He is now serving as mine foreman, at a salary of \$25 less than would be paid a certified man.

Coal companies are frequently like individuals, "penny wise and pound foolish." In their attempt to save a few dollars on the salary of a good man, they lose many times that amount by employing an incompetent person in his place. Coal companies are prone to look at the present output rather than the future development of the mine and, on that account, some of the cheaper unqualified men do very nicely for a year or two, by working out the near-by coal and drawing pillars without duly considering the effect on the future development of the mine. Such men quickly come to the end of their string and are wise enough to resign before the growing scarcity of available coal proves their incompetency. They get a good recommendation from the company and go elsewhere to play the same game on another mine that they find in good shape for their operations.

A good foreman taking charge of a mine that has been badly managed and much run down, starts to put the haulage roads in shape and open up new work. Money is needed to put the mine in shape and the cost of production is for the time increased. It frequently happens that just as this foreman has got the place in shape to make a good showing on the cost-sheet, the company finds that he is too expensive a man and are willing to replace him with an uncertified man who will work for less money, although he may require some watching.

To my mind, it appears very much as though this new law will set aside perhaps one-third of the certified men in the state and tend to decrease the salary paid the remaining two-thirds, who are able to hold their positions. The salary of a good mine foreman should not be less than \$150 per month, as his services are of as much value to the company as those of the superintendent. In my opinion any mine foreman who is worth less money should be given a job digging coal or put on day work.

In respect to the salary paid mine foremen, coal companies are often shortsighted. I recall an incident that serves to illustrate this point and which came to my knowledge a few years ago. A good mine foreman asked for a raise of \$10 a month, which he felt was rightly due him for his services. Being refused, he decided to make somewhat less effort himself. As a result, instead of going to the mine to look after matters that needed attention at night, he put day men at work to fix up roads, handle pipe and attend to other matters. He made less effort to satisfy men, but met their complaints by allowing them extra pay for deadwork. On the whole, the cost-sheet was increased \$100 a month by these extras. By refusing the \$10 increase asked by the mine foreman, the company sustained a loss of \$90 a month, which was the result of their shortsightedness.

The new Pennsylvania law gives to companies that are foolish enough to take advantage of its provisions the opportunity to reduce the wages paid good men, by using the uncertified man as a club. Good men are thus compelled to accept a lower remuneration for their services when face to face with the alternative of a cheaper man standing ready to take their place. Of course, in adopting such a policy, the coal company runs its own risk, but stockholders and, in some cases, the mine management do not comprehend what is actually at stake in the employment of less competent men who are willing to work for a smaller wage than the position of mine foreman should demand. The subject is worthy of the most careful consideration, as it is one of vital interest to the coal industry.

CERTIFIED FOREMAN.

—, Penn.

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Shortage of Labor in Mining

Letter No. 4—I was greatly interested in the question raised by "Pennsylvania Foreman," as to how to get and keep men in the mines, *Coal Age*, Aug. 5, p. 225, and the several letters discussing this subject that have appeared since. As I am located in a field where labor is probably more scarce than anywhere else in this state, I thought I might be able to say something of interest along this line.

All that has been said in regard to miners being quite independent under the conditions that exist at present in all coal-mining districts is only too true. A short time ago a man seeking work would take any place offered him where he thought he could make a living, but such is not the case today. Miners move from one place to another for no apparent cause, except that they are tired of staying in one locality. They seek the slightest excuse for going away. A few such instances that I have observed lately are as follows:

A man ordered groceries one morning that did not reach him until the afternoon of the next day, and he quit that night, saying that he would go where he could get better service. Another case was where the children of

two families could not agree, but were constantly fighting, with the result that the father of one of the families decided to move to get his children away. The superintendent had a little talk with the other man, telling him that he should not allow his children to cause so much trouble, at which man No. 2 also decided to leave the place. Other causes are: No railroad cars for one day, throwing the mine idle; an overcharge on a man's store account, or short time reported at the office.

On these slight pretexts men will quit their jobs today where they would not have thought of doing so a few months ago, and on this account, the lives of a superintendent and mine foreman are a continual worry. In one instance a mine employing 100 loaders was reduced to only six men, and no better mine could be found in the district. There seems to be a disposition on the part of a certain class of miners to take advantage of the present situation, even though they injure themselves in so doing. I can indorse the statement made in the "Coal and Coke News," *Coal Age*, July 22, p. 164, where a Charleston correspondent states, "There is not at this time any idle men in the country, but there is at all times a percentage of men who, though they have good jobs, can be induced to go elsewhere."

THE WORK OF "TRANSPORTATION AGENTS"

There are men scattered in the different mining districts throughout the country who are known as "Transportation agents," and as has already been stated in the previous letters on this subject, these agents promise the men big money and good work, offering to pay all transportation expenses. As soon as an agent has secured a certain number of men, he purchases a party ticket and starts them on their way. Arriving at the destination, the agent is paid an agreed price for each single man and usually double that amount for married men. I believe I can say truthfully that nine-tenths of these men do not stay long enough to pay back the charges for transportation advanced by the company.

A remarkable instance of this kind that recently set mine officials to thinking was the following: A man who had gained the goodwill of the mine officials who had employed him as a guard during a strike at their mine was sent out into another field to get men. The company agreed to pay him \$1 a head for single men and \$2 for married men. The 30 men he brought into camp were the toughest outfit that could be found. The morning after he received his money for the men, there were only two of them found ready to go to work.

A little investigation revealed the fact that the remaining 28 men were just over the mountain in an adjoining state and expected to go to work in a mine there for another company. The agent was thus drawing double pay for the same men. The lesson this incident teaches is that operators should make greater efforts to keep their good men and should stop dealing through transportation agents, as the class of men they secure are the worst element found in mining.

A short time ago a mine operator in this field was asked how it was that he could keep his men and maintain a regular output when other mines in the district were tied up for the want of men. His reply to this question may be of interest; it was as follows: "I get the men's confidence through their wives and their stomachs." He explained that he kept good houses, well supplied with

water and convenient for the wives. He did not wait for the miner to order coal, but sent a small amount to the house, to be paid for during the month. He appealed to the men's stomachs by keeping good food that a working man would want and delivering it to the homes as soon as ordered.

When hiring men he uses good judgment, choosing the best. Most of his men are married and show an interest in fixing up their homes. At this mine there are no extra daymen, but the loaders are paid to timber their own places and lay the tracks in their rooms. By this means every man makes good wages, and the mine has a reputation for working full time. This foreman's adyie is, "Treat all men in a gentlemanly way and provide for them the necessities of life, at a reasonable charge, and you will not want men when labor is scarce."

Clothier, W. Va.

OSTEL BULLOCK.

Letter No. 5—I have been interested in reading the letters on the present shortage of labor in coal mining. Reference has been made to the drifting about of a large class of coal miners, and I want to mention a few reasons that I believe give rise to a disposition of many miners to leave one place and go to another.

Being a machine runner myself, I hear many complaints made by good miners, most of which never reach the ears of superintendents or even the mine foremen, because many men do not care to be known as tale-bearers. Some of them would rather quit than to enter a complaint when their place is poorly ventilated owing to the lack of a proper system in the circulation of the air currents throughout the mine.

This may be due to a lack of sufficient ventilating power for which the mine foreman is not to blame, but it is more frequently the result of a foreman's ignorance in regard to the first principles of ventilation. Many mine foremen know very little in regard to splitting the air current, but depend almost wholly on the old method of coursing the air through the mines. Many give little heed to the proper building of the stoppings on main and cross-entries, which often leak so badly that it is impossible to conduct the air forward in sufficient volume to ventilate the working face.

Men cannot be blamed for making up their minds to find work in a mine that is better ventilated when compelled to work under such conditions. Another frequent cause of the desire to seek another place is lack of needed material, rails and timber, which should always be supplied promptly as ordered by the miner. Again, it often happens that a miner finds his coal is not cut or his place full of water. The failure of the machineman to cut the coal may be the miner's own fault when his place is not properly cleaned up so that the machine can work, or it may be due to the inefficiency of the machine runner or the accidental breaking down of the machine. Some of these causes cannot be avoided, which every miner knows, but it is up to the mine foreman to make them as few as possible. System and discipline will go far to eliminate these delays, which cause the miner the loss of much time, money and effort.

As miners express it, "coal mining is either a feast or a famine." When times are hard, the mines are apt to be flooded with men who know nothing of mining coal and seek work in the mines only to tide them over a present crisis. I have often been advised by old ex-

perienced miners to quit mining and learn a trade. They say to me, "Dan, if I were a young man like you I would never work in a mine. There is nothing in it but a bare existence and often a poor one at that if a man has a family to support." But a coal mine has a fascination for me. I have found it remunerative and hope some day to be a mine foreman or superintendent.

Wellsburg, W. Va.

D. F. SMITH.

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Gathering-Motor Haulage

Letter No. 2—The question of gathering-motor haulage is an important one, since this form of gathering haul must be installed in many mines in the near future. The conditions are widely different in different mines, and this fact makes it necessary to give careful consideration to the work of gathering cars and making up trips under varying conditions in the workings.

Referring to the letter of R. Z. Virgin, *Coal Age*, Aug. 26, p. 361, I note that he is operating in $5\frac{1}{2}$ -ft. coal, where the conditions are quite favorable for taking the locomotive to the face of each room. Not only this, but larger cars having a capacity of, say from 2 to $2\frac{1}{2}$ tons each can be used. This will mean the hauling of more coal in a single trip than can generally be hauled in two trips where the cars are of necessity small, holding from 1 to $1\frac{1}{2}$ tons each. With the larger cars there is a less proportion of dead weight hauled.

The conditions are quite different in working a seam where the coal is from 3 to 4 ft. high and often less. In these mines the gathering haul is often a matter of much concern to the mine foreman, owing to the extra expense of ripping top or lifting bottom in order to secure the necessary headroom on the roads. While such work is necessary on all roads, it is generally impracticable to do the same in the rooms. On this account small cars are required that can be taken to the faces of the rooms and handled when loaded by the miner, who is often required to push his car from the face of his room to the entry where it is taken by the driver. In mines where this must be done it would be impossible to handle large cars. The use of small cars means, also, a larger force of men to load the same weight of coal.

In the mine where I am employed a motor hauls the coal from the face of the entry to the tipple. The empties are stood on one entry, while the loaded cars are placed in the other entry. The miner is obliged to push his loaded car out to the entry and take an empty car back with him to the face of his room. While this system has worked successfully at our mine, there is an increased agitation among the men in regard to handling their own cars in the rooms that is liable to cause much trouble, and to avoid this some method must be found to overcome the difficulty in the near future. For this reason the question of gathering-motor haulage is an interesting one.

Where motors are used, we have found that it is necessary to have the road well ballasted and drained, the track as straight as possible and the rails heavy enough to carry the extra weight of the motor without bending. The shock due to the high speed at which the motor is run is a severe tax on the rails, and it is necessary that track ties be evenly spaced and put nearer together than in mule haulage. Also, the rails must be well spiked to the ties and bonded if electric haulage is used.

Spangler, Penn.

E. E. M.

Inquiries of General Interest

An Uncommon Gas Mixture

A few days ago I had an unusual experience when examining the mine for gas. I found a gas that was different from anything I had ever seen before and thought that someone might be able to explain the nature of the mixture, which had accumulated at the roof in the same manner as a body of marsh gas, but seemed to produce a different effect on the lamp flame, as the latter was first depressed and then filled the lamp and almost as quickly died out.

On going into an entry where I expected to find some gas, I lowered the flame of my lamp as usual. When coming nearer to the face of the coal, it was plain to me that I was approaching an uncommon situation. The flame of my lamp suddenly flattened out around the wick tube and remained so for three or four seconds, then spread out to the gauze and rising to the top of the chimney, went out and left me in the dark.

I was using a common Davy safety lamp. During the eight years that I have firebossed I have never seen anything like what I have just described. I concluded that this was a body of strong marsh gas, probably mixed with other gases, but I had no way of proving that such was the case, and would like to ask *Coal Age* readers to explain what, in their opinion, caused this peculiar action of the flame of the lamp.

FIREBOSS.

Clarksville, Ark.

The occurrence described by our correspondent is a very common one in the use of an unbonneted Davy lamp. When such a lamp is exposed to a body of "sharp gas," or gas before it has been diluted with much air, the flame may be depressed by the gas, since marsh gas undiluted with air is extinctive of flame. The entrance then of a little fresh air may cause the flame to rise from the wick and circulate in a weird, uncanny manner in the top of the lamp for a moment and then disappear. The action described would seem to indicate a mixture of marsh gas and carbon dioxide, commonly known as "flashdamp."

The action of the flame, in this instance, is wholly dependent upon the amount of dilution of the gas within the lamp. The wick flame is more quickly extinguished than the flame of the burning gas, which fact causes it to ascend from the wick and circulate in the upper part of the lamp. The combustion of the gas within the gauze produces carbon dioxide, which is the cause of the ultimate extinction of the flame.

A few years ago, when engaged in calibrating the sight indicator, which is an arrangement of looped platinum cross-wires on an upright support fixed in a Davy lamp, I often observed the flame leave the wick and ascend in the gauze.

The sight indicator is shown in the accompanying figure. The flame of the lamp being adjusted in fresh air so that the lower straight wire called the "standard wire" just incandesced, the introduction of the lamp into a mixture containing $\frac{1}{2}$ per cent. of gas would cause the

incandescence of the first looped wire, while higher percentages of gas would cause the successive incandescence of the wires above, up to 3 per cent. of gas.

In the calibration of this device, it was placed in an unbonneted Davy lamp, for which purpose it is designed. The lamp was then hung in a box provided with a window for observation and so arranged that an air current charged with any desired proportion of gas was passed upward through the box and carried off through a stack or chimney above. By means of a vane below the box and a damper above, a uniform distribution of gas in the current was secured, and any desired gaseous condition could be maintained continuously within the box.

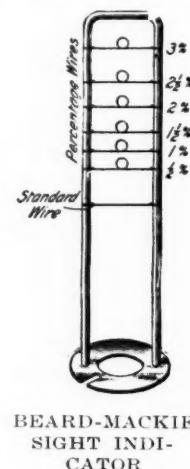
What is of interest, in this connection, is the observed action of the flame when the percentage of gas was largely increased.

The flame would then frequently leave the wick and circulate in the upper portion of the gauze and chimney, while the wires of the indicator incandesced brightly. If now the percentage of gas in the current was reduced, the flame circulating in the chimney above would dart down and again ignite the wick of the lamp. I have observed the same conditions when exposing the unbonneted Davy equipped with indicator to a strong blower of gas in the mine, while taking care that the blower did not impinge directly on the gauze of the lamp. A fireboss

who was present remarked that he would have lost his light in making the same test. It was the incandescence of the wires that retained the flame and enabled the wick to relight when the percentage of gas was reduced.

A fireboss, in testing for gas in mines, under varying conditions and with varying mixtures of air and different gases, often observes peculiar and interesting phenomena. The moment of greatest danger in testing for gas occurs when the lamp has been exposed to a body of sharp gas that causes it to flame and is then withdrawn from the gas. The lamp must be withdrawn from the gas with great caution, as the fresh air entering from below renders the mixture within the lamp highly explosive. Frequently, small balloons of flame will rise from just above the wick and ascend in the chimney with a slight pop or explosion. This frequently happened in the calibration of the sight indicator just mentioned and was a very pretty sight to witness.

The work of testing for gas in the mine is always attended with danger, as the slightest defect in the lamp may cause ignition of the gas outside the gauze; or a lack of judgment, a spirit of recklessness, or the inexperience of the man making the test may cause disaster. When an accumulation of gas has been discovered in a place in the mine, no attempt should be made to fool with it or unnecessarily expose the lamp to its atmosphere.



Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—How many foot-pounds of work will be required to change 85 lb. of water, at 90 lb. absolute pressure, into steam at the same pressure?

Ans.—The question as stated is incomplete, as it fails to give the temperature of the water. It is probably intended to ask: What work will be required to change this weight of water, at a temperature of, say 32 deg. F., into steam at 90 lb. absolute pressure? The total heat in steam above 32 deg., at 90 lb. absolute pressure, as taken from steam tables, is 1,184.4 B.t.u. per lb. Then, since 1 B.t.u. equals 778 ft.-lb., the total work performed on 85 lb. of water, under the assumed conditions, is $85 \times 778 \times 1,184.4 = 78,325,000$ ft.-lb.

Ques.—How many pounds of steam at 80 lb. absolute pressure will be required to raise the temperature of 250 lb. of water from 35 to 100 deg. F., assuming that the water and steam are mixed without loss of heat?

Ans.—The total heat in steam at 80 lb. absolute pressure, as taken from steam tables, is 1,182.3 B.t.u. per lb. Since the final temperature of the water is 100 deg. F., the heat given up by the steam is $1,182.3 + 32 - 100 = 1,114.3$ B.t.u. per lb. The total heat absorbed by 250 lb. of water in raising its temperature from 35 to 100 deg. F. is $250 (100 - 35) = 250 \times 65 = 16,250$ B.t.u. The total weight of steam required to supply this amount of heat to the water is therefore $16,250 \div 1,114.3 = 14.58$ lb.

Ques.—The distance from the fulcrum of a safety valve to the valve stem is 5 in., the diameter of the valve seat 2 in., the weight of the lever 16 lb., and its center of gravity 10 in. from the fulcrum. If the ball weighs 60 lb., how far should it be set from the fulcrum in order that the valve will blow off at a boiler pressure of 100 lb. per sq.in.?

Ans.—Assuming that the 16 lb. mentioned includes the weight of the lever, valve and valve stem and that their combined center of gravity is 10 in. from the fulcrum, and calling the required distance of the ball from the fulcrum x , we have, since the sum of the moments of the weights of the ball and the combined weight of lever, valve and valve stem acting downward is equal to the moment of the total steam pressure acting upward on the valve,

$$60x + 16 \times 10 = 100(0.7854 \times 2^2)5$$

$$x = \frac{100 \times 3.1416 \times 5 - 160}{60} = 23.5 \text{ in.}$$

Ques.—A boiler requires 2,500 lb. of water at a temperature of 100 deg. F., per hr. If the steam pressure is 120 lb. gage at sea level, what is the equivalent evaporation of this boiler per hour, from and at 212 deg. F.?

Ans.—The absolute pressure corresponding to 120 lb. gage at sea level is $120 + 15 = 135$ lb. per sq.in. The total heat of the steam above 32 deg., for this pressure, as taken from the steam tables, is 1,192 B.t.u. per lb.

The equivalent evaporation from and at 212 deg. F., is found by multiplying the actual weight of water evaporated (2,500 lb. per hr.) by what is called the "factor of evaporation." This factor is obtained by dividing the heat absorbed per pound, in changing the feed water at a temperature of 100 deg. F. into steam at a pressure of 120 lb. gage, by the total heat in steam at 212 deg. F., (970 B.t.u.), which gives, in this case, $(1,192 + 32 - 100) \div 970 = 1.158$. The equivalent evaporation of 2,500 lb. of water is therefore $2,500 \times 1.158 = 2,895+$ lb.

Ques.—A boiler evaporates 4,000 lb. of water per hour, when the temperature of the feed water is 70 deg. F. and the gage pressure 80 lb. per sq.in., at sea level; what is the horsepower of the boiler?

Ans.—The absolute pressure corresponding to 80 lb. gage, at sea level, is $80 + 15 = 95$ lb. per sq.in. The total heat in the steam above 32 deg. F., for this pressure, as taken from the steam tables, is 1,185 B.t.u. per lb. The factor of evaporation, in this case, is $(1,185 + 32 - 70) \div 970 = 1.182$, and the equivalent evaporation, from and at 212 deg. F., for 4,000 lb. of water is $4,000 \times 1.182 = 4,728$ lb. The standard boiler horsepower is the evaporation of 34.5 lb. of water per hour, from and at 212 deg. F. Hence, the horsepower of the boiler, in this case, is $4,728 \div 34.5 = 137+$ hp.

Ques.—How many cubic feet of water will be required per day of 24 hr. to supply 15 boilers of 325 hp. each when evaporating steam under a gage pressure of 160 lb. per sq.in. at sea level and using feed water at a temperature of 110 deg. F.?

Ans.—The absolute pressure corresponding to 160 lb. gage at sea level is $160 + 15 = 175$ lb. per sq.in. The total heat in the steam above 32 deg. F., for this pressure, as taken from the steam tables, is 1,196 B.t.u. per lb. Then, the factor of evaporation is $(1,196 + 32 - 110) \div 970 = 1.152$, and since the standard boiler horsepower is the evaporation of 34.5 lb. of water, from and at 212 deg. F., the equivalent evaporation, in this case, is $34.5 \div 1.152 =$ say 30 lb. per hp. per hr. The total weight of water required to supply 15 boilers of 325 hp. for 24 hr. is then $15 \times 325 \times 24 \times 30 = 3,510,000$ lb., and the volume of this water is approximately $3,510,000 \div 62.5 = 56,160$ cu.ft.

Ques.—The elevation at the top of a shaft is 1,050 and that at the bottom 650 ft. above tidewater. What is the pressure per square inch in a water pipe 16 in. in diameter, and what is the total pressure at the bottom of the pipe when the latter is full of water?

Ans.—The head of water producing pressure at the bottom of the pipe is $1,050 - 650 = 400$ ft. The unit pressure due to this head is $400 \times 0.434 = 173.6$ lb. per sq.in. The sectional area of a pipe 16 in. in diameter is $0.7854 \times 16^2 =$ say 201 sq.in. Then, assuming the pipe is full of water, the total pressure on this area at the bottom of the pipe is $201 \times 173.6 \div 2,000 =$ say 17.44 tons. The total pressure due to a head of water is always found by multiplying the area pressed, in square inches, by the unit pressure (lb. per sq.in.).

Coal and Coke News

Harrisburg, Penn.

The Public Service Commission, in order to systematize the great amount of work coming before it has fixed a rule that hereafter the first week of the month will be trial week, the second, argument, the third week is set aside for consideration of reports on cases assigned to various commissioners, and the fourth to work of individual commissioners and hearings outside Harrisburg.

Notice has also been served that complainants and applicants for hearings and their counsel must be ready to proceed at the time fixed for their cases. After notice of hearing is served counsel is allowed five days in which to notify the commission that the date will not be satisfactory.

Reforestation Is to Be Discussed

Members of the State Forestry Commission will meet in Hazleton on Sept. 29, at which time plans for the prevention of forest fires in the anthracite coal field and the restoration of the denuded forests will be considered. The officers of the state will confer with the officials of coal companies who operate in the field indicated. Plans for the meeting are now under way and details will be announced later.

Among the companies who will be represented and which take a big interest in this meeting are the Lehigh Valley Coal Co., Lehigh Coal and Navigation Co., and the Philadelphia & Reading Coal and Iron Co. A number of coal companies have already started to reforest their lands.

Income of State Fund Will be Large

Judging from the way business is being written by the State Workmen's Compensation Insurance Fund, the total premium income of the state fund will be close to a million dollars by the end of the year. The revenue already in sight is over three-quarters of a million dollars and there has been a steady flow of new business, while some reports have been received of employers who held liability insurance turning to the state fund.

The number of policies is now about 14,000. The experience of the state fund, which has been unusual in many respects, is attracting wide attention among insurance people. The fund has had but few big accidents to compensate and the results for the year are being awaited with interest.

State Constabulary Does Good Work

Members of the state constabulary, who have been termed the "American Cossacks" by union leaders, and the abolition of whose organization these union leaders have sought to bring about, have been proving just the organization to protect the United Mine Workers of America in the I. W. W. crisis.

For several weeks the upper end of the anthracite field has been in a reign of terror, caused by the presence of I. W. W. leaders who so inflamed the minds of foreign-speaking coal miners that the strength of the miners' organization was seriously threatened.

At the first sign of trouble state troopers and squads of deputy sheriffs were on the scene and for several weeks the "American Cossacks" have been battling to preserve law and order and to protect the United Mine Workers of America organization.

While they were out putting down riot and disorder, officials of the mine workers were travelling throughout the district pleading with their members to remain loyal to the organization.

"The Cossacks" have been the men of the hour in Luzerne and Lackawanna Counties and their ability to meet all situations and fight when a fight is necessary has perhaps put down the I. W. W. agitation and saved the United Mine Workers of America. Enthusiasm of the former organization, which is on strike in Jessup and the various boroughs throughout the upper region, has been considerably dampened following the wholesale arrests in Old Forge recently.

PENNSYLVANIA

Anthracite

Minooka—In order to quell a fire in the workings of the National Colliery of the Delaware, Lackawanna & Western R.R. coal department under West Minooka, officials of the company have decided to dig a trench 30 ft. wide 60 ft. deep and approximately one-half mile in length. Two steam shovels are already at work and considerable time will be required to complete this excavation.

Wilkes-Barre—Anthracite shipments for August amounted to 5,531,097 tons as compared with 5,462,127 tons for August of 1915 and 5,432,878 tons for July of the present year. Strikes and the celebration of feast days interfered with operations. The Lehigh Valley Coal Co. led in ship-

ments with a total of 1,026,074 tons, the Reading being second, with 1,000,667 tons. The Lackawanna shipped 875,131 tons and the Erie 638,044 tons. The Delaware & Hudson Co. produced 572,822 tons.

Hazleton—The operations of the G. B. Markle Coal Co. have been working quite steadily all summer, despite the labor shortage. They lead all the individual operators in production during 1914 and 1915 with a tonnage of over 1,000,000 tons. According to the latest reports they will retain the position during 1916, being the heaviest individual producers in this district.

Port Clinton—The tonnage of coal carried via the Schuylkill Canal this season will likely be the smallest in the history of navigation, as the culm deposits in the channels have just been removed sufficiently to admit of transportation between here and Philadelphia for the first time since last year.

Nesquehoning—On the ground that it pays 75 per cent of the school taxes in Mauch Chunk township the Lehigh Coal and Navigation Co. is opposing the plans of the school board to erect a new high school building at a cost of \$190,000. It claims a violation of the school code law in that the cost of the building was originally fixed at \$60,000 and has appealed to the State Board of Education.

Scranton—A surface subsidence occurred in the road at Hampton Street and 13th Ave. recently. The hole was about 5 ft. deep and is said to be over a surface vein of the Sloan-Central workings of the Delaware, Lackawanna & Western R.R. Co.

Ashley—Felix Philopowicz, of Philadelphia, has brought suit against the Lehigh and Wilkes-Barre Coal Co., asking \$20,000 damages for injuries sustained by a fall of rock in the mines, while employed as a miner some eighteen months ago.

Lansford—Extensive stripping operations are now being conducted by the Lehigh Coal and Navigation Co. between here and Nesquehoning.

Tamaqua—The colliers in this district are beginning to suffer from lack of water due to the continued drought, and unless there is a rainfall soon the operators will be compelled to haul water via the railroads.

Bituminous

Somerset—The coal operators of Somerset County are considering the advisability of organizing an association to promote their interests, especially along those lines which will enable them to market the product of their mines to better advantage.

Connellsville—Connellsville is to have a mine-rescue station, which is intended to serve the section of the coke region in the immediate vicinity of Connellsburg and also the city and environs. This will be the second station in the coke region to be established in furtherance of the plans of the Associated Companies to provide district facilities for rescue work. A station has already been located at Orient for the equipment and support of which the coke companies in that district will make annual contributions based on tonnage output. The Connellsburg station will be maintained on the same plan. The H. C. Frick Coke Co. has been operating three stations of its own for a number of years. When the Connellsburg station is equipped there will be a total of five in the region. At each of these stations a full complement of rescue apparatus will be constantly kept on hand. Teams from the several mines and coke plants in the districts will be sent to these stations, for special instructions. Through the establishment and maintenance of the station the companies which assist in its support will be allowed a total reduction in compensation insurance rates of 30c. per \$100 of payroll.

The production of coke in the Connellsburg region for the week ending Sept. 9 aggregated 348,371 tons, of which the merchant operators produced 150,819 tons, while the miners interests made 233,555 tons. Compared with the previous week this shows a loss of 19,771 tons.

Rices Landing—Important improvements are in progress at the plant of the Crucible Coal Co., having in view enlarged output and better facilities. A new steel tipple is being erected to take the place of the wooden one which has done service since the plant was started. A new hospital and several dwellings are among other improvements made. The plant now has a capacity of 30,000 tons of coal per month and in time it is expected to more than double this amount. Part of the coal is shipped by boat and part by rail.

Johnstown—The mine rescue car of the U. S. Bureau of Mines recently arrived at Hastings,

where it will remain until Oct. 8, after which it will be taken to Arcadia, remaining there until Oct. 14. The car is in charge of J. V. Berry and a corps of assistants.

Monongahela—Fire, supposedly of incendiary origin, recently destroyed the two coal tipples of the Diamond Coal Co. at Houston Run. The fire was first discovered in the river tipple but a high wind carried it to the railroad tipple adjoining. The miners used dynamite to prevent the flames spreading to company houses and other buildings. The loss is estimated at \$25,000. Officials of the company report that it is probable that the tipples will be rebuilt at once.

Brownsville—Coal shipped to the huge byproduct plants now under construction by the U. S. Steel Corporation subsidiaries in Clairton will be transported by river. Work of preparation to supply the demand from the Bridgeport and other mines of the H. C. Frick Coke Co. has already begun. River trade will be greatly stimulated. Shipments from the Colonial workings of the Frick Co. will be made through the Alice opening recently purchased from the Pittsburgh Coal Co. The H. C. Frick Coke Co. has done but little river shipping during the last ten years.

Punxsutawney—A new coal operation is being opened at Locust, north of Rochester Mills on the Buffalo, Rochester & Pittsburgh R.R. A spur from this road to the mine opening will be built. The operation is being opened on the Ward Caiderwood farm.

WEST VIRGINIA

Beckley—The output of mines on the Virginian R.R. is increasing, and some shortage of labor is reported. The railroad is putting back into service men who were laid off four years ago.

Bachman—The River Valley Colliery Co. has let a contract for the erection of a storage bin for coal. This firm is also preparing to build a coaling station for railway locomotives.

Fairmont—The Monongahela R.R. has engineers surveying a line from Fairmont to Bellington in Barbour County, where connection can be made with the Coal & Coke and Western Maryland roads.

On Saturday morning, Sept. 16, at 7:45 a pumper going into mine No. 43 of the Consolidation Coal Co. at Monongah, discovered that one of the pumps located in an advance heading had become overheated and had started a fire. All men were immediately ordered from the mine and the fire reported to headquarters. Rescue and fire crews immediately assembled at the mine and proceeded to get control of the situation. It was found by the rescue crew that in leaving the mine six men had been overcome; unfortunately one of these men was dead when discovered, the other five, however, were brought out and sent to the hospital and are rapidly recovering. While it appeared at first that the fire might be of considerable extent it was found to be comparatively small and confined to a point near the face of one of the advance headings. No particular difficulty was found in sealing off the heading close to the fire, first with temporary wood brattices and then with concrete brattices, into one of which was inserted a gate valve. This work was completed Sunday morning. As the fire was small and in a completely isolated position no further difficulty is anticipated and the mine was in shape to resume work on Sept. 18.

Omar—Bids are being received by the Main Island Creek Coal Co. for the construction of 3 mi. of railroad which will be used in the operation of new mines to be opened by that company.

Morgantown—The Lehigh Coal Co. operating near here and owned largely by citizens of Cleveland, Ohio, recently filed a petition in voluntary bankruptcy in the Federal Court at Cleveland, and was adjudged bankrupt. This company's affairs have been in litigation in the Circuit Court of this county for some time. It is said, however, that the company has been operating successfully for the past few months and making a profit. Between \$7,000 and \$8,000 had been recently invested in new equipment.

VIRGINIA

Graham—It is reported that the George L. Carter interests have purchased a large boundary of coal land in Tazewell and Buchanan counties, Virginia, and will soon begin the development of these properties on an extensive scale. The land is situated principally on Big Creek.

ALABAMA

Birmingham—A shortage of freight cars in southern cities for the shipment of ores, fruit and cotton is beginning to assume serious proportions. In the Birmingham district the shortage is also affecting the movement of coal, pig iron and other products.

KENTUCKY

Lexington—November will see the completion of Lock No. 14, the last of the locks proposed by the Federal Government in improvements of the Kentucky River. This lock is at Heidelberg, Lee County, and with the other improvements, it is expected to open water transportation to Beattyville. Numbers of mines are to be developed in that vicinity, it is stated.

Whitesburg—In order to meet increased heavy coal traffic from the Elkhorn and Boone's Fork coal fields the Louisville & Nashville R.R. is doing considerable ballasting, leveling the track, etc., besides other improvements. It will be necessary to add other trains.

Railroads are remedying the slight car shortage existing throughout the Boones Fork and Elkhorn field. There is unusual activity throughout this section.

Hazard—Work has begun on the Kentucky River Power Co.'s \$200,000 plant near Hazard, from which this city and the different operating companies will receive their supply. Long-time contracts have been made with the coal companies, consisting of more than 20 firms.

Weeksbury—The construction of the Long Fork branch of the Baltimore & Ohio R.R., from the Forks up Left Fork of Beaver Creek to Weeksbury, 26 mi., is rapidly progressing. A number of coal companies are getting into readiness to ship coal from along this route. The road will be completed and in operation within six months.

Barbourville—When the first locomotive on the Cumberland & Manchester R.R., being constructed from Barbourville to Manchester, steamed across the Clay County line on Sept. 13, there was a full-sized celebration. The remaining 12 mi. of the line will be rushed to completion and trains are to be operating into Manchester by the end of November, it is claimed. Three construction crews are working night and day. The new line, being built by Charles F. Heiderick, of Pennsylvania, will open up a rich coal and timber section, and extensions into Red Bird and other rich Clay County sections are projected.

Middlesboro—The Fernlake Coal Co. has begun construction of a new tipple and tramway at its operation near here.

Pineville—Property of the East Jellico Coal Co., at Tinsley, was bid in at the commissioner's sale by M. F. Whitehill, of Clarion, Penn., at \$102,000, Mr. Whitehill representing the bondholders. The company owns extensive areas in Bell and Knox Counties. The mines are among the best equipped in the section and it is understood that the White Log Coal Co., incorporated by Mr. Whitehill, D. B. Logan and B. F. Logan, with a capital stock of \$20,000, will continue their operation.

Central City—Under the eyes of a guard with a machine gun, mounted in a commanding position, and by the aid of two searchlights at night, work on reconstruction of the burned tipple of the Central Coal and Iron Co. is going forward night and day. Three shifts of workmen are pushing the job to completion so that the 300 miners may return to work. There have been no developments in the local labor situation.

OHIO
Cadiz—Michael Gallagher, of Mount Pleasant and Cleveland, is preparing to put in another steam shovel in the Beech Springs neighborhood.

Canton—A battery of coke ovens of the United Furnace Co. plant is slowly being brought up to a sufficient heat to permit firing. Fires have been going in the ovens for more than a month getting them in readiness, and coke will soon be produced.

East Liverpool—The power house of the Storm-Louis Coal Co. at Salineville was completely destroyed by fire recently. About 100 miners employed in the mine will be thrown out of work at least temporarily.

Bellaire—The annual sub-district Miner's Day will be observed at Bellaire, Ohio, Oct. 7, according to action taken recently by the sub-district board. It is believed that about 10,000 miners will attend the celebration.

ILLINOIS
Dawson—The Dawson mine, recently taken over by the newly organized Dawson Coal Co., will resume operations in a few days. The company houses are being repaired and made ready for the occupancy of miners' families and it has been announced that the company store will be reopened. The new company now has control of all the mines of the Wabash Coal Co. and it is understood that all will be in operation soon.

Staunton—Central Illinois operators are preparing for a busy winter. A large proportion of the mines are being operated as continuously as the car supply will allow. Others which have been closed for a time are getting ready to reopen. Favorable general conditions and the opening up of a western market for Illinois coal through the reduction of rates by the Chicago & Alton R.R. are the causes. Reports from other sections are that the same expectancy and activity are the rule all over the state.

Springfield—Interest in the Illinois miners' election to be held Dec. 6 is strong. Vice-President Frank Hefferly has announced his candidacy for state president in opposition to Frank Far-

ington, the incumbent. An attempt is being made to create an issue unfavorable to Farrington on Farrington's recent endorsement of Frank O. Lowden for the Republican nomination for governor. The candidates for vice-president are William Burton, of Herrin, and D. T. Stewart, of Christopher. Duncan McDonald, the incumbent, and Walter Nesbit, of Belleville, are the candidates for secretary. John Zimmerman, incumbent, Edward Weick, of Staunton, and William Sneed, of Herrin, are contending for a place on the National Executive Board.

An order of the Illinois Public Utilities Commission regarding the furnishing of coal cars by the railroads was recently affirmed by Judge Creighton in the Circuit Court. The companies have been furnishing coal cars to the mines on the basis of what they supplied last year, and the coal operators complained to the Commission, which ordered that the roads furnish the cars to the mines as they were required.

UTAH

Salt Lake City—More orders are being received now by Utah coal mines than at any previous time in three years, but the mines are unable to obtain enough cars to haul their output. Many coal dealers are ordering at the same time, and indications are that the demand will continue sharp until the first of the coming year.

Foreign News

Edinburgh, Scotland—The 23d annual conference of the National Union of Scottish Mine Workers, at which 94,000 miners were represented, was recently held under the presidency of Robert Smillie. It was resolved that in view of the urgency which exists for a full output of coal, the members of the union be strongly recommended to ballot in favor of the mines being kept open six days per week. It was also moved that steps be taken to insure surface workers having the same percentage of increases in wages as those employed underground.

Personals

R. R. Atkins, now chief engineer for the Federal Coal Co., has been advanced to the position of assistant superintendent.

E. T. Jones, of Hollsopple, Penn., has resigned as a mine boss for the Victor Coal Co. He will take two or three months' rest before resuming work.

Edward Johnson, one of the owners of the Lorain Coal and Dock Co., of Columbus, is recovering from an operation for appendicitis at a local hospital.

D. M. MacWhirter has resigned his position as assistant superintendent of the Federal Coal Co., Straight Creek, Ky., to go into engineering work with Johnston & Johnston, Pineville, Ky., beginning Oct. 1.

James A. Meehan, a well-known mining man, was recently chosen general superintendent of the operation of the Kennerly Coal Co. He will have charge of the Meco, Pretoria, Confluence, and other plants.

Hugh Gaffney, former superintendent of the Provident mine at St. Clairsville, Ohio, who resigned recently, has been made superintendent of the Black Oak mine of the Wheeling & Lake Erie Coal Co. at Lafferty.

Ray G. Baker has resigned his position in the engineering department of Pardee Brothers & Co., Latimer mine, and accepted the position of assistant engineer for the Ellsworth Collieries Co., at Ellsworth, Penn.

M. A. McGinnis and **Alfred J. Tonge**, coal-mining superintendents from Nova Scotia, recently visited the Fairmont region inspecting mining machinery. They expect to install new equipment in their mines in Nova Scotia.

W. D. Gulley recently leased the coal mine of the La Belle Iron Works at Wheeling, W. Va., and will operate it himself. The mine has been idle for some time, but it is expected to be ready for operation within a few days.

Richard Bowen, of Plains, Penn., who has filled positions in the mine from door boy to mine foreman, is a candidate for the position of mine inspector. Mr. Bowen is now a foreman for the Pennsylvania Coal Co. He is a graduate of the Wilkes-Barre Y. M. C. A. School of Mines.

W. H. Cunningham, secretary of the West Virginia Coal Operators' Association, together with counsel for the coal operators, expects to attend what is believed to be the final hearing before an Interstate Commerce Commission examiner on the proposed increase in freight rates on West Virginia coal to Lake points in Detroit, Sept. 26.

Secretary B. F. Nigh, of the Michigan-Ohio Indiana Coal Association, has started on a membership campaign, covering all three states included in the organization. Quite a few retailers in the territory are not members of the organiza-

tion and it is planned to secure as many members as possible by circular letters and personal solicitation.

M. A. Rowan, mining engineer for the coal properties of the Chicago & Eastern Illinois R.R., with headquarters at Nokomis, Ill., is temporarily located at Clinton, Ind., opening the Klondyke shaft in the No. 4 vein, and preparing to sink a shaft to the No. 5 vein west of it. The additional shafts will make a total of twelve mines on these properties, located in Indiana and Illinois.

Obituary

Robert E. Owen, a retired employee of the coal-mining department of the Delaware, Lackawanna & Western R.R., died recently at his home in West Scranton, after an illness of several weeks. He was for many years employed as fireboss at the Bellevue colliery, and was pensioned in January of this year. Mr. Owen is survived by his wife and three sons.

John V. Beekman, for many years connected with the Lidgerwood Manufacturing Co., passed away at his home at Plainfield, N. J., recently. Mr. Beekman was born in 1842 at Somerville, N. J. About 1870 he engaged in the manufacture of rotary engines, pumps, etc., being a member of the firm of John A. Lighthall-Beekman & Co., with works at Imlay St., Brooklyn, N. Y. This company was absorbed by the Lidgerwood Manufacturing Co. in 1873. Mr. Beekman assuming charge of the works of that company, and was the inventor of many improvements in hoisting engine design. He gradually withdrew from active participation in business about 10 years ago, devoting his later years to outdoor pleasures, becoming an enthusiastic motorist and golfer, being a member of several golf clubs, and a familiar figure on the golf course at Pinehurst, N. C., where he spent his winters. For many years Mr. Beekman had been a member of the American Society of Mechanical Engineers. His death is keenly felt by his surviving family, and by many of the men with whom he was formerly associated.

Industrial News

Youngstown, Ohio—Construction of 87 byproduct coke ovens by the Brier Hill Steel Co. will be begun by Jan. 1.

Memphis, Tenn.—The Pittsburgh Coal Co. is building three new tugs of modern type to increase its fleet here.

Red Ash, Ky.—The Stines Coal Co. has been incorporated here with \$1,000 capital, by Henry Stines, Lewis and Thomas Francis.

Pineville, Ky.—The Crane Creek Coal Co., a new development on Yellow Creek, is reported to have been purchased by Middlesboro interests.

Ebensburg, Penn.—Twenty-five carloads of material to be used in the new mining operation on the John Kirschner farm, near Ebensburg, have already arrived.

Cabin Creek, W. Va.—The Consolidated Coal and Mining Co. has let a contract to Tom Storey to build 40 cottages, each to have four rooms, hardwood floors, etc.

Frankfort, Ky.—The State Workmen's Compensation Board has adopted the merit rating schedule, as of Aug. 1. This applies to all risks subject to merit rating.

Uniontown, Penn.—The Pennsylvania Fuel Co. was recently organized with a capital of \$10,000. The incorporators are S. A. Carson, F. W. Newhall, W. H. Long, all of Uniontown.

Viper, Ky.—A new coal development is planned here by W. A. Scott and others. It is planned to develop the old Brashear tract—the development of which was started last year.

Canton, Ohio—The Huff Run Coal Co. has been organized with a capital stock of \$20,000. The incorporators are B. F. James, August Heimann, Grace M. James, Albert Ess and Albert Heimann.

Philadelphia, Penn.—The Pretoria Smokeless Coal Co. of Philadelphia, with mines in Somerset County, has been organized. The capital stock is \$5,000, and Ruth E. Dick, of Philadelphia, is treasurer.

Connellsville, Penn.—The Connellsville Indian Creek Coal Co. was recently organized with a capital of \$6,000. The incorporators are Henry A. Porter, K. K. Kramer, and J. N. Grey, all of Connellsville.

Charleston, W. Va.—The Wet Branch Coal Co. has been incorporated with a capital stock of \$50,000, by J. G. Farquhar, L. D. Burns, E. H. Shonk, Russell G. Quarrier and N. E. Farry, all of Charleston.

Barbourville, Ky.—It is announced that the Cumberland & Manchester R.R., to connect Barbourville and Manchester, Clay County, will be completed by Nov. 15. Half of the 24 mi. is already finished.

Pittsburgh, Penn.—The Penn Smokeless Coal Co. of Boswell, Penn., operating near Jerome, Somerset County, has purchased 240 acres of coal land in the same county on the Baltimore & Ohio R.R. near Stoyestown.

Pittsburgh, Penn.—The Amend Coal Co. was recently organized in Pittsburgh with a capital of \$100,000. The incorporators are J. R. Eisaman, J. E. Amend, C. E. Cowan, Paul Johnson, R. W. Playford, all of Pittsburgh.

Houston, Tex.—The American Production Co. of Houston, has been organized with a capital stock of \$100,000, for the purpose of producing coal and oil. The incorporators are Charles Mitchell, L. B. Prewitt and H. H. Hurd.

Fairmont, W. Va.—The William Penn Coal Co. has been organized by Alexander R. Watson, John A. Clark, Jr., Dan E. Percell, August H. Cane and Edgar B. Rowe, of Fairmont. The company is capitalized at \$100,000.

Connellsville, Penn.—A coal tract of 1,750 acres lying in Indiana and Cambria counties has been transferred to the Vinton Land Co., the land holding subsidiary of the Vinton Colliery Co., of Vintondale. The consideration involved is \$349,494.82.

Charleston, W. Va.—W. H. and A. S. Soper, C. A. Snyder and W. J. and M. E. Tutt, all of Des Moines, Iowa, have incorporated the Marine Smokeless Coal Co., and plan to open mines in the smokeless region with a view to engaging in the export trade.

Buffalo, N. Y.—The Equitable Coke Co., of Pittsburgh, has bought the Harwick mine of the Allegheny Coal Co., and appointed C. L. Terry general manager. The Buffalo office of the Allegheny company will hereafter be conducted by the Equitable company.

Bay City, Mich.—Handy Bros., of Bay City, recently closed a deal with the Consolidated Coal Co., of Saginaw whereby the latter acquired a large number of coal leases lying adjacent to its coal properties in Saginaw County. The consideration is stated as being \$150,000.

Greensburg, Penn.—P. W. Doyle, of Greensburg, has been awarded two large mine contracts in Armstrong and Cambria Counties. One of these is for shaft work at Sagamore, Armstrong County, and the other for a shaft and slope at Kelso, near Johnstown, Cambria County.

Sandusky, Ohio—The Kelleys Island Line and Transport Co.'s North Dock, at Kelleys Island, burned recently. The origin of the fire is unknown. About 1,000 tons of coal held in pock-ets on the dock fell into the lake as the supporting timbers were burned away.

Washington, D. C.—Restoration to entry of nearly 457,000 acres heretofore included in coal-land withdrawals in New Mexico, North Dakota, Utah and Wyoming was recently announced by Secretary Lane. Of the total, 324,000 acres by in Wyoming, and 113,000 acres in New Mexico.

Fairmont, W. Va.—About 20 new houses have been built, while 20 more are in process of construction at the Baxter mine of the Stafford Coal Co. These houses are single-family affairs, neatly painted brown with white trimmings. One hundred more men are desired at this mine.

Evansville, Ind.—The Evansville Coal Exchange, comprising practically all the wholesale and retail dealers of the city has been organized and L. H. Kramer chosen secretary. He will conduct a credit bureau. It is stated that the Evansville dealers will advance prices shortly.

Baltimore, Md.—The Big Ben Coal Co. has been incorporated by Baltimoreans for \$200,000 for the purpose of mining and marketing coal. The incorporators are Henry Zollers, Jr., Edward F. Shea, Samuel Duer, Thomas D. Springer, Edward W. Wimmer, Eugene C. Zollers, and Edward J. Star.

Philadelphia, Penn.—J. S. Wentz & Co., coal operators, with offices in the Land Title Building, has taken the entire 17th floor of the building, with the exception of two small rooms, for its main offices. H. C. Barr, the sales manager, under the recent enlargement will occupy room 1719.

Fairmont, W. Va.—Surveying for the new addition to the Fairmont Mining Machinery Co.'s plant has been completed, and the excavation work will be begun immediately. Work at the plant at present is being retarded somewhat because of an inability to secure material from the steel mills.

Connellsville, Penn.—Traffic between Connellsville and Cumberland, Md., on the Baltimore & Ohio R.R. was recently tied up indefinitely when 10 cars of coal in a train of 60 cars were derailed in the Sand Patch tunnel at the crest of the Allegheny Mountains. The accident was due to a broken rail.

Cincinnati, Ohio—Certain real estate belonging to the Marmet Coal Co. and other defendants in the suit brought against it by the People's Coal Co. will be sold under order of the United States District Court on Sept. 30, at 11 o'clock a.m., by the United States marshall. The properties to be sold are valued at \$12,753.40.

Fairmont, W. Va.—The William Penn Coal Co., recently chartered, will take over the Phoenix mine near Clarksburg, and open another shaft in

the same territory. The capital stock of this firm is \$100,000 and the incorporators are Alexander R. Watson, John A. Clark, A. H. Kane, E. Rowe, of Fairmont, and Daniel E. Pursell, of Clarksburg.

Washington, Penn.—It seems assured that the Pennsylvania R.R. will build the Wheeling coal road which has been surveyed from Wheeling to Marianna. This road will compete with the projected Wheeling & Eastern line into Green County and through to the Monongahela River. About 70 per cent. of the right-of-way has already been secured.

Philadelphia, Penn.—A local firm of bituminous operators a few weeks since contracted with the French government for the delivery of 1,000,000 tons of coal, but has as yet been unable to make any shipments, due to the scarcity of vessels. It is thought that the French authorities will supply ships for the movement of the coal in a short time.

Birmingham, Ala.—The Federal Government has authorized a survey of the upper Warrior River to ascertain the cost of construction of the proposed lock and dams at Palos Ferry, Walker County. It has been stated that this work could be done for approximately \$300,000 and would make water transportation available for a vast tonnage of coal in the upper Warrior field.

Philadelphia, Penn.—The Philadelphia Storage Battery Co. has recently opened an office in Huntington, W. Va., which will be in charge of E. H. Becker, who will specialize on electric locomotive batteries. The office is located at Hotel Huntington. Mr. Becker was formerly connected with the Philadelphia Storage Battery Co. and was in charge of the Pittsburgh office for some time.

Indianapolis, Ind.—The Indiana Retail Coal Merchants' Association will hold its first convention in Indianapolis, Oct. 2. Questions relating to freight rates and accommodations, legislation, the kind of coal that can be obtained, and other conditions under which business is done will be considered and investigated. It is the purpose to organize a branch in every city and town in Indiana.

Bangor, Maine—A loss of \$125,000 was caused Sept. 10 by the destruction of the coal pockets of Stickney & Babcock and the Hincks Coal Co., together with the factory and stores of T. Haggerty & Sons. Some 6,000 tons of coal, two-thirds of which was anthracite, together with the towers, engines, pockets, wagons, sheds, stables and coal-handling machinery and supplies, were destroyed. All of the concerns affected plan immediate rebuilding.

Washington, D. C.—Proposal of the St. Louis & San Francisco R.R. to apply a scale of actual net weight at the point of origin on carload shipments of washed coal from the South, was suspended recently by the Interstate Commerce Commission until Jan. 11, pending investigation. Coal and coke traffic from Alabama stations of the St. Louis & San Francisco, and the Birmingham & Southern, and from Memphis to interstate destinations, is involved.

Seattle, Wash.—Coal is now being moved by the U. S. Government's Alaska R.R. from the Matanuska fields to tidewater at Anchorage, the first trainload having been shipped out the first part of September. Alaskans are generally of the impression that this will mean cheaper fuel for the entire country, and it is confidently predicted that it will be followed by new industrial and mining expansion in the north, particularly in the way of the establishment of copper smelters in Cordova.

Fairmont, W. Va.—The Monongah Service Co. has started the construction of a water-works system, which will supply a number of mining communities in the West Fork Valley. The pumping station will be located on the Tygart Valley River, above Kingmont. This will assure the developments on Helen's Run, and at Monongah a good supply of water, and it is likely that the Baltimore & Ohio Railroad Co. will receive some of its water supply from this company, getting service at Monongah.

Philadelphia, Penn.—During the past week the rumor was current in financial circles that the Reading company was about to distribute its shares of stock in the Lehigh & Wilkes-Barre Coal Co. to its stockholders. This it was said was to be done to meet the terms of the recent decision of the court ordering a separation of the railroads from the mining business. The rumor was also prevalent at the same time that President Schwab of the Bethlehem Steel Co. was about to purchase the Philadelphia & Reading Coal and Iron Co. from the railway.

Columbus, Ohio—The Pittsburgh Vein Operators' Association of Ohio has filed a complaint with the Interstate Commerce Commission against the coal-carrying roads, asking that a differential of 50c. a ton be established in favor of coal from the No. 8 Ohio district and the Hocking district as against coal from West Virginia, Kentucky and Tennessee, moving to northern Ohio, Indiana and southern Michigan points. The complaint is in line with that now before the commission in the Hocking Valley case, filed by the Sunday Creek Coal Co. The existing differential is 25c.

Brownsville, Penn.—Continuing developments near Brownsville, the W. Harry Brown interests have begun grading for a row of dwelling houses along new brick road in Fayette County. These houses will extend from Alicia schoolhouse toward Brownsville. The Stark Construction Co., contractor, has a steam shovel at work leveling the tract. At the same time it is preparing to lay a concrete floor at the new storage plant at the northern end of Alicia. The houses in question will be the beginning of a considerable building operation. It is said that in all about 400 houses will be built.

Seattle, Wash.—Having uncovered two coal measures aggregating about 23 ft. in thickness, the Beacon Hill Co., of Seattle, will shortly begin the construction of a byproduct plant on the property according to A. L. Knouse, president. The property has been worked for three years and is located just south of the city limits. The analyses show that the coal is rich in byproducts. Its principle ingredients per ton are: 12 lb. of light oil, 18 lb. of carbolic oil, 20 lb. of creosote oil, 29 lb. of anthracene oil, 48 lb. of pitch residue and 13 lb. of ammonia. The anthracene oils hold in solution some phenol and a large amount of anthracene.

Philadelphia, Penn.—Notice has been received here by the companies interested that the U. S. Department of Justice will shortly file briefs in the Supreme Court at Washington in the actions against the Lehigh Valley R.R. and the Philadelphia & Reading Ry. in order to compel a final separation of the carrying companies from the anthracite mining business. This follows the verdict of a few months since when the courts outlined several plans, either one of which must be adopted by the railroad companies to meet the terms of the decision as given against them. The Government attorneys hope for a final decision some time during October.

Columbus, Ohio—The stockholders of the Heat and Power Fuel Co., incorporated with an authorized capital of \$500,000, under the laws of Delaware, have organized the company by the election of the following directors: N. N. Clark, Baltimore; G. C. Sturtevant, Berlin Heights; P. J. Carroll, Indianapolis; Harry E. Bennett, Sidney, Ohio; James L. Elliott, Columbus; Patrick H. Kelly, Marion; and Edward L. Winslow, Cincinnati. Mr. Winslow was elected president and general manager; Mr. Elliott, vice-president, and P. J. Carroll, secretary. The headquarters will be in Columbus. The company has taken over a going stripping operation in Indiana and also plans to open another stripping operation in eastern Ohio.

Fort Worth, Texas—The Texas & Pacific, Rock Island, Fort Worth & Denver City, Missouri, Kansas & Texas, and other railroads that have been depending largely on the Texas coal fields for their fuel supply, report that they are not experiencing any shortage of coal since the strike of coal miners in Texas, which began Sept. 1. So far the deadlock between the miners and operators as to a wage agreement covering the next two years is unbroken and there is little prospect in sight for an immediate agreement. About 3,000 miners are idle and practically every coal mine in the state is at a standstill. The railroad companies that had been using Texas coal are now securing their fuel from Oklahoma, Colorado, Kansas and other fields.

Philadelphia, Penn.—In a special train of Pullman coaches the Philadelphia & Reading Co. and Iron Co. on Sept. 16 conveyed 200 retail coal men and large consumers of anthracite to the coal region as its guests at the first-aid contests given by the miners at East Mahanoy Junction, Penn. The visitors were handsomely entertained in the coal region, including a dinner served in the open air. Among the more prominent officials in attendance were E. T. Stotesbury, president of all the Reading companies, and W. J. Richards, president of the Philadelphia & Reading Coal and Iron Co. The contest was won by the team from Shenandoah City colliery with an average of 99.3; Wadesville with 98.9 was second, and third place was taken by North Franklin with 97.6. The Philadelphia guests returned to the city in the early evening, a buffet luncheon being served on board.

Chicago, Ill.—It is reported that Indiana coal mines could produce twice the present output if the railroads could supply the cars. The car shortage is greater than ever before at this time of the year. Orders are sufficient to keep every one of the 22,000 miners in the state at work six days in the week instead of three, as is the case. The Northwest is said to be more than 1,000,000 tons short, and there is no possibility of making up a ton of this before the Lake shipments close, Nov. 1, so that the problem of supplying the Northwest in cold weather is a serious one. Many Indiana coal companies are unable to meet their contract obligations for daily shipments. The demand for steam coal increases daily and the seasonal demand for domestic coal is heavier than usual because fewer consumers filled their bins in summer than in former years. Prices are advancing and are 35 and 40c. a ton higher at the mine than a year ago. The railroad traffic managers see no relief ahead in the car supply and no one ventures to forecast the distress that may develop if the winter should be a severe one.

Market Department

GENERAL REVIEW

Anthracite—Passing the between-season's business in excellent shape. Acute shortage of bituminous occasions alarm. Most severe car shortage of the season in the Lake district. Price situation confusing. Domestic trade opens up in the Middle West.

Anthracite—A slight reactionary tendency occasioned by the usual backlog and filling process incident to the between-season's business is noted, though the market continues substantially above the average for this period. Retailers have sufficient business to carry them through easily while wholesale buyers have ceased asking quotations, taking it for granted that the full circular will apply on all orders placed. Independent operators with any surplus coal are able to obtain good premiums on prompt shipments. Shipments to Down East points are subject to delay of several days, pending the arrival of coal to fill out car-goes. The unmistakable symptoms of impending shortages is regarded as ominous, and some of the less conservative members of the trade are already predicting the possibility of a runaway situation when the full winter's business gets under way.

Bituminous—Conservative interests are beginning to view the rush for coal with open alarm. The situation has resolved itself into a general scramble for coal of any kind, and almost irrespective of price, with the result that fictitious values are the rule. On what little free coal appears in the market, there are violent fluctuations, and a general readjustment will be necessary to put the trade on a more stable basis. Already instances are noted of brokers being forced into the open market for tonnage to meet their contract obligations, and other instances of consumers buying spot coal and charging it against their suppliers. And in spite of ruling high prices, there seems to be no possibility of keeping them from going still higher as the season advances. More vessels are available in the export trade, while freights are lower, but it is now a question of getting the coal, as there is apparently none available for prompt shipment. Stocks at all tidewater ports are far below normal, and are probably the smallest in years at Hampton Roads. The scarcity of free coal and the uncertainty over the car-supply outlook tends to restrict speculation, but operators are becoming very conservative over future commitments.

Lake Markets—The most pronounced car shortage of the season in the Pittsburgh district, supplemented by a like scarcity of vessel capacity, is seriously interfering with the Lake movement, and there is now definite talk of all-rail shipments to the Northwest. Supplies at the loading ports are so small that boats are frequently forced to make several different ports to obtain full car-goes. Steam consumption is increasing in all directions, particularly in the iron and steel industries, and it is generally agreed that the market is on the point of further substantial advances. The abnormally high price level still rules but the situation is much confused in this respect, operators in many instances naming fictitious figures to test out the market. At the moment the only prospects for a readjustment to more stable conditions in sight is when Lake navigation closes Dec. 1, which should release considerable tonnage and tend to relieve the heavy pressure for coal. On what few contracts are expiring at this time, operating interests are refusing to consider renewals.

Middle Western—Increased strength in the domestic market is the feature of the week. Retailers are finding that they have overstayed the market in their hopes of obtaining lower prices, and there has been a heavy influx of orders. Retail stocks are understood to be substantially below normal, and this will throw an enormous demand on the market later. In view of the shortage of a million tons at the upper Lake ports, it is now generally accepted that there will have to be a heavy all-rail movement in that direction, and plans are being made accordingly. Reports in all manufacturing lines of maximum consumption continue monotonously the same, particularly in the iron and steel industries, which are operating at especially high capacity. The reduction in rates to Kansas points, supplemented by the restricted production occasioned by the labor difficulties there, has opened a new outlet for Middle Western coal that is taking considerable tonnage.

A Year Ago—Hot weather causes a collapse in the anthracite market. Bituminous continues to improve slowly. Shortage of vessels causes a heavy slump in exports. Car and labor supply becoming important factors.

BUSINESS OPINIONS

Boston News Bureau—When a man studies the situation carefully and unbiasedly, he is forced to the conclusion that primarily the country is sound in practically all essential requirements. There has been no over-stimulation in any particular. Values today measured by earnings are far above prices. We think at times that we have fully discounted our prosperity, but so far as the best judgment reasons we are far from it. It is a matter of common knowledge that sentiment has been remarkably conservative, considering all the favorable conditions which have developed. No one ever imagined that our foreign trade would total the figures it has. No one ever dreamed that we could corral foreign gold to the extent that we have. No one ever thought that our earning power could total what it has. Now that we are approaching a national election the prospect of a broader and a stronger governmental policy is making for a greater financial and commercial confidence. The end of the war will bring forward economic problems that will be a menace if not settled right.

Iron Age—The drift of the steel trade is toward higher prices and greater difficulties in delivery. In brief, the situation is that Europe will take whatever amount of steel American mills will agree to deliver when wanted, and that domestic buyers are providing for their wants in the first half of 1917 at prices they were unwilling to consider two months ago. Consumers are acting on the more definite signs that with the war prolonged through 1917 the steel works of the country will continue to have to choose between buyers. A significant case is the buying of 230 locomotives by the New York Central. Deliveries are not wanted before the last quarter of 1917. Locomotive works could build them earlier, but the railroads looked rather to the steel situation and to the large impending foreign orders.

Bradstreet—Further progress, the keynote of this week's dispatches, typifies confidence in the future, and while industry strains to meet demand, consumptive requirements seem to proceed apace at a record gait. Home needs, added to foreign wants, being dual preeminent factors, with America freed of practically all foreign competition. High prices cause some purveyors to be cautious, but in the great majority of cases these only seem to whet demand, climbing tendencies with persistent strength virtually having eliminated expectations of lower levels for manufactured goods. In any event, demand is extraordinary, orders for spring account are coming out, most producers are taxed to the utmost to fill wants, the agricultural sections, buoyed by better conditions as to late crops and high prices for those already garnered, are settling old accounts, and at most centers shelves are barren of carried-over stocks.

Dry Goods Economist—Converters of cotton goods are being sounded by the mills as to contracts for 1918. Naturally, at this date, with so many important contingencies likely to arise, even the biggest operators are unwilling to place contracts for delivery more than a year in advance at the prices which are now ruling, especially when these prices represent an advance of fully 50 per cent. over those of two years ago. For example, a gray cotton which then sold at 9c. is being offered for 1918 delivery at 13c.

Dun—In nearly all important industrial and mercantile lines the trend is toward a further increase in activity, and is exceptionally marked in some directions. Manufacturing plants are being operated to their capacity, the shortage in the supply of labor being practically the only deterrent to additional expansion. The demand for fall merchandise is encouragingly brisk and the general business sentiment is optimistic. In the Central States the movement of commodities continues well sustained and reflects prosperous conditions. Commercial failures this week in the United States are 264 against 243 last week, 277 the preceding week, and 351 the corresponding week last year.

American Wool and Cotton Reporter—A greater amount of wool was sold last week than for some time. Sales aggregate 7,000,000 lb. Manufacturers are realizing that prices will be no lower and that Boston is the cheapest market in the world today. Transactions have been chiefly on domestic wools. They include all kinds of territories, both graded and original, and also fleeces. To a large extent, activity in the woolen goods market has declined because it is a between-seasons period and also because of earlier buying. A serious problem confronts producers on heavyweight fabrics, and it is expected that fabric weights will be cut to the lowest possible points. The cotton goods market has shown more activity

during the last week partly because buyers are beginning to realize the situation and partly because manufacturers have been willing to accept prices somewhat lower than were noted a week or so ago. The export situation is being neglected to an extent at present because the domestic situation compels the sale of goods to the domestic buyers. Some believe that consumption of goods actually only started and that it will be much larger than it has been.

Marshall Field & Co.—Wholesale distribution of dry goods for the current week shows a substantial gain over the corresponding period of a year ago. Spring sales on our lines of ginghams have been so much in excess of past years that they will be sold up shortly. Spring sales on our other lines of merchandise now being shown on the road are heavy, indicating that retailers have every confidence in the continuance of good business. More customers have been in the market during the week. Collections are in excess of the same period of a year ago. The market on domestic cotton goods is strong and active.

MARKET OPINIONS

The current market situation as viewed by some of the leading companies is:

F. D. Gleason Coal Co., Detroit, Mich. (by F. D. Gleason)—The current market is good, and the outlook very favorable. The movement is fair, but cars are very scarce. Prices on slack are 75c. higher than a year ago, and coarse coal 25c. to 35c. higher. The scarcity of coal at the head of the Lakes and the unprecedented industrial activity are undoubtedly going to result in a very active situation.

Morrison Coal and Coke Co., Baltimore, Md. (by L. C. Lorraine)—The market was a trifle soft immediately following the threatened railroad strike, due to the surplus stocks accumulated, but the outlook is good. It is a little difficult to get spot coal, but the prompt movement is good. Prices on spot coal will average about 35c. more than at this time last year, and contract prices are 25c. to 35c. higher.

Skeele Coal Co., Boston, Mass. (by William A. Jepson)—We are short of both anthracite and bituminous, and prices are advancing. Both the contract and prompt movements are good, and with the coming of cold weather the outlook is the very best. Consumption of bituminous is very heavy. Prices on soft coal at the mines are almost double that of last year. The situation is extraordinary, with shortage of both cars and labor, and scarcity of water transportation. There is no telling how serious the outcome may be in event of bad weather.

Black Gem Coal and Coke Co., Chicago, Ill. (by M. A. Rolfe, President)—The market is satisfactory in every way. The domestic trade is taking all the coal produced at good prices, and the steam trade is willing to pay a fair price. The outlook is for a prosperous season. Shipments are behind orders, but contracts are being taken care of fairly well. Contract prices are fully 10 per cent. higher than last year on coarse coal, and from 10 to 25 per cent. higher than a year ago on fine coal. Steam consumers are not attempting to force prices down this year as usual, when they can be assured of delivery. On domestic sizes it is very difficult to fill orders even at a premium. Most of the mines are only able to work about half time because of the scarcity of cars.

C. W. Moderwell & Co., Chicago, Ill. (by C. W. Moderwell)—The steam-coal market is unusually good, and the domestic trade excellent. A continuation of the present inadequate car supply will cause a strong market. Orders are coming in freely and shippers are behind. The contract movement is governed entirely by the car supply. Advances in price are about sufficient to take care of the increased cost of mining. Should there be storms and a cold winter, there will undoubtedly be a shortage of coal in the Northwest, as the railroads already have more business than they can take care of now.

Wallins Creek Sales Co., Inc., Pineville, Ky. (by E. R. Clayton, Sales Manager)—The market is bullish, and the outlook unsatisfactory, because of the inadequate car supply. The prompt movement is very poor, and the contract movement unsatisfactory. Prices are higher than a year ago. We are unable to fill orders for domestic coal at the present time, and it is difficult to predict what the outcome will be when the natural winter's demand sets in. The car supply is about 50 per cent. normal, and this is making it difficult to meet obligations on contracts.

Frank X. Frank, Vancouver, B. C.—Conditions are prosperous in this section. The coal trade has improved materially, and the outlook is bright.

Atlantic Seaboard

BOSTON

Strength of Pocahontas and New River maintained. Tidewater receipts light and spot prices high. Georges Creek unchanged. Occasional sales of Pennsylvania grades at new high figures, but only for quick shipment. Anthracite situation gets worse.

Bituminous—One of the interesting features of the market is the calm way in which consumers accept the situation. There is no feverish anxiety to buy; it is simply the watchful attitude that might be expected say in an active spring market when prices are \$2 or so less than at present.

There is, however, no abatement in the firmness of coals at Hampton Roads. Contract demand is most insistent, and of itself is more than enough to absorb the light receipts at the piers. Inquiry for spot coal is steady, much of it coming either from shippers who need coal to clear their vessels or from consumers seeking to make up the arrears on deliveries. We are apparently in for a long period of high prices, figures on the recent Panama R.R. contract running to Sept. 30, 1917, being a more than usually significant development in that direction.

The country-wide shortage of labor is being felt in the West Virginia fields to an extraordinary degree. Shippers are much hampered by the inability of operators to get anything like a normal output. In some cases mines are only on a 60% basis. With most of the agencies sold up to 75% some idea can be had of the prospect for December and January. Gradually increasing delays in loading will also have a serious effect on this market, dependent as it now is in such large measure on regular weekly trips of steamers. Five or six days' detention at the loading ports each trip would cut in half the usual quota for Tide-water New England.

Occasional cargoes are offered on the open market. They are confined rather closely to shippers who in this way try to recoup themselves for low-priced contracts undertaken a year ago. The \$3.25 on cars of that period is in strange contrast with prices today. The volume of "spot" sales for inland delivery is relatively small. This trade is now adjusted to yearly contracts entered into with factors who own rehandling plants and steamers that are relied upon to arrive regularly. It turns out, however, that some of these interests are striving to protect themselves by buying Pennsylvania coals all-rail to keep customers supplied.

Georges Creek output is still light and with no prospect of improvement. One or two of the smaller agencies have free coal at prices around \$3.75@4 f.o.b. Philadelphia or \$5.25@5.50 alongside Boston. Contract obligations on this grade are now greater than can possibly be filled and there is an increasing number of consumers anxious to know where their fuel is coming from.

The Pennsylvania bituminous interests continue conservative on sales. The labor supply is so uncertain that many operators have sold only a minimum tonnage. When output increases for a few days the extra coal is sold on the spot market at remunerative prices. If marine transportation were more plentiful there would be ready sale for cargo lots at Boston, Providence and Portland. Prices are \$5@5.25 alongside, depending on quality.

Bituminous quotations at wholesale, f.o.b. loading ports at points indicated, are about as follows, per gross ton:

	Clear-fields	Camb. & Son's	Geo's. Creek*
Philad'l'a...	\$2.75@3.30	\$3.00@3.60	\$3.07@3.17
New York...	3.05@3.60	3.30@3.95	3.37@3.47
Baltimore...			3.00@3.10
F.o.b. mines	1.50@2.10	1.75@2.35	2.00@2.10

* On contract.

Pocahontas and New River are quoted at \$4@4.50 f.o.b. Norfolk and Newport News, Va. On cars Boston and Providence, the range for the same coals is \$6.25@6.50.

Anthracite—The demand from the West and the near approach of heavy drafts from the big cities cause added worry to New England retailers. Not only are water shipments slowing up at a time when the need is urgent but it is next to impossible to get forward domestic sizes in the proportion required. Dealers are obliged to accept sizes like chestnut and pea when they are in distress for egg and stove. Those at points farther east who are normally able to secure barge coal from New York or Philadelphia are in many instances chartering schooners at going rates hopeful of getting cargoes in season for fall trade.

There is some anxiety here of the prospect for screenings and steam sizes. Cargoes are so infrequent that retailers hesitate to displace domestic sizes but it is realized that later the junior sizes will be in still sharper demand at points nearer the mines. Independent coal companies to be offered broadcast.

All-rail deliveries have been very satisfactory thus far. As a result the line dealers are in fairly comfortable position.

PHILADELPHIA

Anthracite orders above normal. All shippers heavily booked. Stove and pea very active, though egg and chestnut are at a standstill. Buckwheat in good demand. Bituminous prices continue upward. Shippers short on contracts. Tide shipments heavy.

Anthracite—The wholesale market exhibits a slight falling off at this time. The heavy consignments to this city during the strike scare, with the weather too warm to enable the dealers to secure any new business, had a depressing effect. However, despite this temporary check the business really continues above the average for this time of year and all shippers, especially the big companies, report an abundance of orders. Individual shippers also seem well satisfied, as a number of them have instructed their salesmen to cease taking any more orders this month for the sizes most in demand.

The large retailers have sufficient business to carry them through easily until Oct. 1, and the arrival of the first frosts of the year is expected to make things improve rapidly.

The cut prices in the Northeastern section of the city are causing much discontent among the retailers, and this week the evil spread further down town where a new dealer opened an old yard and is offering all sizes at prices 25c. less than other dealers.

The shippers continue to hold firm in their prices and with rare exceptions ignore offers of the dealers to take certain sizes at reduced rates. In fact, the wholesale market is in such a healthy state that it is unusual to receive a request for prices, most buyers taking it for granted that the full circular rates will prevail on all orders they place. There are a few exceptions on chestnut size only.

All the broken coal for which contracts were made early in the season is being called for at \$3.50 and any production in excess of this is snapped up at \$3.60. Undoubtedly egg coal has fallen off locally but is sure to react with the first cool weather; as the demand to New England points continues, there is no falling off in the mine price of \$4.15.

While the immediate demand for stove has probably decreased, owing to the heavier shipments to this market, the orders on hand are still out of proportion to the other prepared sizes and shippers are not likely to want for stove business for months to come. When other than a regular customer offers to buy, the salesman almost invariably tries to have the order carry egg and nut sizes, but even then no definite promise of shipment is made.

Chestnut has stood still for the past ten days and would actually be weak if this market were dependent upon to absorb the production. As it is, several of the largest shippers are now picking it up from storage for consignment to the West.

Requisitions for pea are so heavy that it is only a question of a short time when the dealers here will be receiving storage coal. One large company considered going into its storage piles this week, but decided to hold off awhile until the dealers are still less critical. The circular price of \$2.20 is cheerfully paid by the retailers; this is \$1.70 less than the next largest size, chestnut, and this accounts for the demand for the one and the indifferent buying of the other.

With the prices for bituminous coal gradually increasing, anthracite buckwheat began to stiffen materially this week. A short time ago it was easy to secure an occasional car of this size at the contract price of \$1.55, but this figure soon changed to circular of \$1.65, and now many of the individuals are asking and getting from 5c. to 10c. a ton more than this. The other steam grades are holding their own, although most of them are being moved at the regular contract prices.

As is usual at this time of the year, collections are gaining in strength and there is no doubt that the lowest ebb of the entire year in this respect is now passed.

The prices per gross ton at mines for line shipment and f.o.b. Port Richmond for tide shipment are as follows:

	Line	Tide	Line	Tide	
Broken...	\$3.60	\$4.75	Buck...	\$1.65	\$2.55
Egg...	4.15	5.25	Rice...	1.00	1.90
Stove...	4.40	5.60	Boiler...	.90	1.80
Nut...	4.50	5.55	Barley...	.75	1.65
Pea...	2.80	3.70			

Bituminous—The rising market continues in greater degree than last week. Every grade selling here has shared in the increase, the changes ranging from 5c. on most of the Fairmont coals to 10c. to 15c. on Georges Creek and the better Pennsylvania fuels, with \$2 coal becoming common.

The sustained upward trend is becoming very expensive for some brokers, and they are actually being compelled to sell coal for less than they paid for it, in order to meet their obligations. For this reason, most of the trading now is between houses. In many instances of unfilled contracts the charge is often made, particularly by the railroads on supply fuel, that the shippers are taking advantage of the high prices and neglecting their contracts. There are frequent instances of consumers buying coal in the open

market and charging the difference against the contractor.

There is very little spot coal to be had, and salesmen in soliciting trade are rarely able to quote prices and when they find a customer are compelled to hunt for the coal. All quotations are made for immediate acceptance, and we know of one instance where the price of several cars increased 35c. per ton in an hour. The greatest activity is probably at the piers, as the coastwise shipments, especially to New England ports, are heavy. In addition an extensive bunker trade at all coast ports has drawn heavily on available supplies.

Shortage of cars and labor and restricted railroad movement, continue to affect the situation, while the demand for coal is probably greater than ever before in the history of the coal business. While present prices may seem high, all are agreed that with no prospect of any change in present conditions, much higher prices are bound to prevail later.

The prices per gross ton, f.o.b. cars at mines, are about as follows:

Georges Creek Big Vein.....	\$2.15@2.25
South Fork Miller Vein.....	2.15@2.25
Clearfield (ordinary).....	1.85@1.95
Somerset (ordinary).....	1.80@1.90
West Va. Freeport.....	1.80@1.85
Fairmont gas.....	1.80@1.90
Fairmont gas, mine-run.....	1.60@1.70
Fairmont gas, slack.....	1.45@1.55
Fairmont lump, ordinary.....	1.60@1.70
Fairmont mine-run.....	1.50@1.60
Fairmont slack.....	1.45@1.55

NEW YORK

Anthracite gaining strength and premiums paid for quick shipments. Bituminous orders plentiful but no coal to fill them. New business refused.

Anthracite—The anthracite situation continues to gain strength and some producers are sold up for the next six weeks. Shippers who have surplus stocks are able to obtain premiums for prompt shipments. Few wholesale dealers are taking on new customers, having all they can do under present conditions to take care of their regular trade. Several good-sized orders which would have netted a handsome profit have been refused because of the lack of supplies and the uncertainty that confronts the producers.

Line trade is going full blast and demand is becoming more pressing while dealers are complaining of slow deliveries. Considerable tonnage is moving to Long Island points and the line deliveries in New England are picking up. In New York harbor, shippers of large cargoes are frequently delayed for several days while waiting for coal to complete the tonnage required.

Independent producers and wholesale dealers are already obtaining as much as 25c. above company circular for egg and stove, while higher premiums have been offered for quick delivery. The trade was further stimulated somewhat by the threat of the boatmen to quit work.

Chestnut coal is nearly on a par with egg and stove. There is very little surplus and with few exceptions it is bringing full company circular.

Pea coal is freer but demand is normal. Some grades were sold at 15c. off but these were the cheaper kinds.

Demand for the steam sizes is stronger. Buckwheat No. 1 is scarce and some shippers are getting from 10 to 15c. above regular circular. Buckwheats Nos. 2 and 3 are freer but are moving easy.

Current quotations, per gross ton, f.o.b. tide-water, at the lower ports, are as follows:

	Circular	Individual
Broken.....	\$4.95	\$5.45@5.70
Egg.....	5.45	5.70@5.95
Stove.....	5.70	
Nut.....	5.75	5.65@5.75
Pea.....	4.00	3.85@4.00
Buck.....	5.75	2.65@2.90
Rice.....	2.20	2.10@2.20
Barley.....	1.95	1.90@2.00
Boiler.....	2.20	

Quotations at the upper ports are generally 5c. higher on account of the difference in water-freight rates.

Bituminous—There are plenty of orders with no coal to fill them. Prices remain strong and with demand continuing as it is now there does not seem to be much opportunity for the delinquent buyer to fill his bins at lower figures. Most shippers are refusing to take on new business.

There is enough coal coming in to take care of contracts, but the surplus supply is scarce and a stray lot is quickly absorbed. Buyers from New England are frequently seen in the wholesale district, while others continue to travel over the mining regions closing up contracts wherever possible.

No better reports are received from the mines regarding car supply. Shipments to the West are delayed considerably by the scarcity of box cars. Lack of bottoms has not permitted as much coal to be sent into New England as shippers would have desired. Dealers there have

much empty space to be filled before the winter begins.

Current quotations, per gross ton, f.o.b. Tide-water, for various grades, are as follows:

	Port Reading	St. George	Mine Price
George Crk.			
Big Vein	\$3.50@3.75	\$3.50@3.75	\$1.95@2.20
Tyson	3.30@3.50	3.30@3.50	1.75@1.95
Clearfield	3.25@3.60	3.25@3.60	1.70@2.05
South Fork	3.50@3.65	3.50@3.65	1.95@2.10
Nanty Glo.	3.40@3.50	3.40@3.50	1.85@1.95
Som'r. Co.	3.35@3.50	3.35@3.50	1.80@1.95
Qu'ch'ing	3.30@3.40	3.30@3.40	1.75@1.85
W. V. Farm't			
T'qua	3.60@3.80	3.60@3.80	1.80@2.00
Mine-run	3.50@3.70	3.50@3.70	1.70@1.95
West. Md.	3.00@3.20	3.00@3.20	1.45@1.65

BALTIMORE

Market tight due to restricted production and car scarcity. Prices very firm. Anthracite business stronger. Exports improve.

Bituminous—There has been a stiff market the past week. This is due largely to the fact that production is still held down by labor scarcity, while the car situation has also taken a turn for the worse. All better-grade steam coals are now at two dollars or better, and the less desirable fuels are not far behind. Except for gas slack, there are no coals offering for less than \$1.50. Prices to the trade at the mines are as follows:

Georges Creek Tyson, \$2@2.25; South Fork, \$2.15; Somerset, \$2; Clearfield, \$2; Latrobe, \$1.75; Quemahoning, \$2.15; Freeport, \$1.70; Fairmont gas three-quarter, \$1.65; same, mine-run, \$1.50; same, slack, \$1.40.

Anthracite—A much better demand has developed for small sizes, and there is a shortage in some directions, as it has been difficult to get prompt deliveries from the mines. The last of the summer order business is now being delivered by most of the dealers, who expect to shortly have the decks cleared for the regular fall and winter trade.

Exports—An improvement was noted in exports as reported by the Customs House for the past week. A total of 6,403 tons was loaded for foreign ports, and the carriers also took 6,641 tons of bunker coal. The export report for the month of August, just issued, shows a total movement from Baltimore of 104,795 tons. Italy led with 25,973 tons, and Argentina was next with 23,724 tons.

HAMPTON ROADS

Exports heavy. Coastwise shipments fair. Bunker demand good. Stocks depleted and delays are serious. Prices firm.

With the further drop in freight rates, those to the Plate having declined \$1.25 in the past week, more export tonnage could no doubt be moved if shippers had the coal. No coal seems available for prompt shipment on new business, all the receipts being required on contract obligations. Several new destinations appear on export shipments for this week. Foreign sailing vessels are here in larger numbers than ever before. One shipper has five in port this week. Coastwise tonnage is moving in fair volume and more would be shipped on this class of business if the coal was obtainable. The demand from New England is insistent and very good prices are secured by anyone having free coal.

The requirements of bunker steamers are very large at present, both as to number of steamers and tonnage taken. Bunker steamers are receiving good despatch, not being subjected to the delays experienced by cargo vessels.

The Norwegian steamship "Bjornstjerne Bjornson," blacklisted by the Allies, had considerable difficulty in securing bunker coal recently. The coal was finally secured from one of the small dealers here with no foreign business or connections.

Stocks are far below normal and it seems almost impossible for any shipper to accumulate a surplus. Business is of the hand-to-mouth variety, receipts never quite coming up to requirements. Stocks at Hampton Roads are probably the smallest in years.

Shortage of coal and congestion of vessels of course makes for delays; these have been and are still serious, both as to vessels loading foreign and coastwise. The delays occur waiting at anchor for the cargo to arrive; after the vessel is at the dock loading is completed in short order.

Prices are firm as follows for Pocahontas and New River: For cargo, \$3.75@4 per gross ton. For bunkers, \$4@4.25 per gross ton plus 10c. per ton trimming. On tracks for local consumption \$3.50@3.75. Anthracite, \$7.50 per net ton delivered.

Railroad Tonnages—The following is a comparative statement of the tonnages handled by the different roads for the weeks ended Sept. 16, 1915-16, and for the first 12 weeks of the last half of the years:

	Week		12 Weeks	
	1915	1916	1915	1916
Nor. & West...	182,047	173,412	2,214,189	1,967,853
Ches. & Ohio...	87,680	95,876	1,148,576	1,173,693
Virginia...	59,597	92,890	809,974	1,042,476
Total.....	329,324	372,078	4,172,739	4,184,022

Ocean Shipping

OCEAN FREIGHTS

But few steamers have been chartered since last report for export coal, and these were effected at or about rates we recently quoted. The Greek steamer "Aristoteli C. Ioannou" is reported as having been chartered in London for coals, from Virginia to Buenos Aires at \$14.40 September loading.

We would quote freight rates on coal by steamer as follows:

	Sept. 11	Sept. 18
West Coast Italy	\$27.60@28.80	\$27.60@30.00
Marseille	25.20	25.20@26.40
Barcelona ²	21.60@24.00	22.50@25.20
Montevideo	14.40	14.40 about
Buenos Aires	14.40	14.40 about
Rosario	15.60 about	15.60 about
Rio Janeiro	12.25	12.25 about
Santos	12.75	12.75 about
Chile (good port)	9.00@10.00	9.00@10.00
Havana	4.00 about	4.00 about
Cardenas, Sagu	5.00 about	5.00 about
Cienfuegos	4.50@5.00	4.50@5.00
Port au Spain	6.00 about	6.00 about
St. Lucia	6.00 about	6.00 about
St. Thomas	5.50 about	5.50 about
Barbados	6.00 about	6.00 about
Kingston	4.50@5.00	4.50@5.00
Curacao ¹	5.25 about	5.25 about
Santiago	4.50@5.00	4.50@5.00
Guantanamo	4.50@5.00	4.50@5.00
Bermuda	4.00 about	4.00 about
Vera Cruz	6.00@6.50	5.50@6.00
Tampico	6.00@6.50	5.50@6.00

¹Spanish dues for account of cargo. ²And p.c. ³Or other good Spanish port.

Note. Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

W. W. Battie & Co.'s Coal Trade Freight Report.

VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

NORFOLK

Vessel	Destination	Tons
Wethersfield ⁴	Vera Cruz, Mexico	2,400
Papa ¹	Dakar, F.W.A.	1,436
Alexander Kjelland ²	Buenos Aires, A. R.	3,384
Kim ³	Rio de Janeiro, Brazil	7,995
Port Curtis ³	Buenos Aires, A. R.	6,465
Ulysses ⁶	Cristobal, C. Z.	12,032
Jeremiah Smith ⁶	Sanchez, San Domingo	511
Panaman ⁷	La Palta, A. R.	7,260
Purus ⁶	Rio de Janeiro, Brazil	1,091
Largo Law ⁸	Bahia Blanca, A.R.	6,292
Staut ³	Stroemnaes Harbor, South Georgia	1,755
Bowden ⁵	Cienfuegos, Cuba	1,131
Giuseppe G ¹	Italy (any port)	4,728
Ryde ³	Buenos Aires, A. R.	4,700
Commodore Rollins ⁸	Havana, Cuba	1,424
Hermes ³	Rio de Janeiro, Brazil	5,567
Teresa Aceame ¹	Genoa, Italy	1,895
Vellor ¹³	Montevideo, Uruguay	6,907
Audun ⁹	Bergen, Norway	3,074
Uranus ¹⁰	Italy (any port)	5,484
Margaret M. Ford ¹⁰	San Domingo City, S. D.	508
Stephen ¹¹	Para, Brazil	2,571
Abaris ⁹	Bordeaux, France	4,598
Caspian ¹¹	Valparaiso, Chile	3,532

NEWPORT NEWS

Dorothy ⁵	Piraeus, Greece	1,680
Hermod ²	Barbados, B. W. I.	4,545
Frontera ⁶	Cienfuegos, Cuba	753
Rodfaxe ²	Havana, Cuba	2,127
Munabro ²	Havana, Cuba	6,600
Wellington ¹²	Dakar, F.W.A.	8,347
Mary F. Barrett ²	Fajardo, Porto Rico	2,669

PHILADELPHIA

Priscilla	Genoa	
Lavinia M. Snow	Halifax, N. S.	1,346
Leontinus	Havana	
Rio Blanco	Rio Janeiro	
Mar Negro ²	Valencia	
Vollrath ²	Gothenberg	
Adsalom	Antilla	
Wilmore ²	Marseilles	
E. A. Dannehower	Yarmouth, N. S.	500

BALTIMORE

Trelyon	Argentina	4,100
Skinfaxe	Costa Rica	1,762
Sticklestad	Egypt	9,910
Treliske	Argentina	4,011
Confeld	Argentina	3,764
Franklin	Egypt	6,515
Frearne	Argentina	6,340

¹ Pocahontas Fuel Co. ² Berwind-White Co. ³ Castner Curran & Bullitt. ⁴ Baker-White Co. ⁵ Smokeless Fuel Co. ⁶ W. C. Atwater & Co. ⁷ Virginia Coal Co. ⁸ Clinchfield Coal Corporation. ⁹ C. G. Blake Co. ¹⁰ Flat Top Fuel Co. ¹¹ C. & O. Coal & Coke Co. ¹² C. H. Sprague & Son ¹³ C. & O. Coal Agency Co.

COASTWISE FREIGHTS

Marine rates on barges and vessels, 2,000 tons upward, remain nominally at \$2, Hampton Roads to Boston, so far no concession being reported. Most of the shippers are already under engagement to load more tonnage than present mining would justify and for that reason inquiry is rather slack at the moment. It is noticeable that consumers under contract who own their transportation are giving more advance notice of their probable requirements as to loading, in some instances seeking commitments from sources of supply two and three weeks before boats report. For New York loading the demand for anthracite is so great that rates are very firm, particularly to Long Island Sound ports; \$1.30 is the current basis, 6 to 8 days to load and discharge.

PANAMA CANAL

Fuel movement through the canal for the week ended Aug. 26 was as follows:

Vessel	From	To	Tons
Alderney	Baltimore	Caldera	*5,000
Ranacagua	Baltimore	Valparaiso	*6,000
Lauro	Norfolk	Iquique	5,167

*Coal and coke. ²Coke and general cargo.

The total coal movement through the canal for July amounted to 56,477 tons.

Coal is supplied to vessels at both Cristobal and Balboa at the rate of between 600 and 1,500 tons per day. Prices Aug. 30 were: At Cristobal, from lighters, trimmed in bunkers, or from cars alongside wharf, handled by ship's gear, per ton, \$6; use of steam hoist and crane per hour, \$2; at Balboa, the price is \$1 more per ton, either form of delivery. Prices will be advanced on Oct. 1.

The first commercial use of the new coaling plant at the Atlantic terminus of the Canal was made Aug. 30, when the steamship "Otaki" was taken alongside the reloader wharf to receive 550 tons of coal.

OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

PHILADELPHIA

Vessel	Destination	Tons	Rate
G. R. Edmonds	St. Stephen, N. B.	438	
A. E. Bullard	San Juan, P. R.	1,223	
Leonatus	Havana	1,346	
V. C. Records	Manzanillo	263	
R. R. Douglas	St. John, N. B.	399	
	BALTIMORE		
Wascana ¹	Rio Janeiro	2,612	\$12.50
G. M. Grant	Barcelona	1,148	11.50
	VIRGINIA		
Kim	River Plata	4,800	*15.00
Aristotelis	Buenos Aires	1,853	14.40
Carmona	River Plata	1,300	13.00
Baron Fairlie	Buenos Aires	2,323	14.40
	ATLANTIC RANGE		
Thor I	Norway	2,655	
	NEW YORK		
Wawenock	Campbellton	258	

Lake Markets

PITTSBURGH

Car shortages increased. Market recovered from recent stocking up. Steam slack higher.

Car shortages are decidedly more pronounced and are interfering with coal production to a greater extent than at any time since the Lake season opened. In the case of Lake coal, however, there is an equal shortage of vessels and it is doubtful whether Lake shipments could be increased no matter what the car supply. There is still talk of some movement by all-rail routes to the Northwest this winter but as yet this talk is not accepted very seriously.

General demand has practically recovered from the effect of the efforts to stock up at the time of the threatened railroad strike and can be described as normal. Requirements of steel mills on regular contracts have increased, as the steel mills have more active operations with the improved weather conditions. Shipments to by-product ovens continue heavy, both from the Pittsburgh district and from the Connellsville region, shipments from the latter being 275,000 to 300,000 tons a week.

Best gas slack continues to bring excellent prices, \$1.40 and thereabouts

to quote prices and that when they do the coal moves so slow that it is hard to fill an order. But for the fact that the consumers are depending on contract orders there would be a scramble for coal in all directions. As it is all jobbers are sending out many inquiries whenever they have an order to fill. Shippers and operators are putting fictitious prices on their coal to shut off orders.

Reports of slow mining and still slower movement of cars are repeated everywhere. Operators are getting so desperate that they are taking all sorts of steps to obtain miners. The steel mills are taking the men away from the mines at advanced wages, making the situation in the long run still worse.

There are many conflicting prices given out and even the buyer does not always know whether they are genuine. The idea is general that the winter will see a great scarcity of coal, especially at outlying points, if there is much snow and severe weather.

There is no official change in the Pittsburgh quotations for this market, but everything is strong and the fact that Ohio No. 8 is within 10 or 15¢ of Pittsburgh is enough to indicate much strength. Regular quotations remain as follows:

	Allegheny	Penn
Pittsburgh	Valley	Smokeless
Lump.....	\$2.95	\$2.75
Three-quarter.....	2.85	2.60
Mine run.....	2.75	2.50
Slack.....	2.40	2.30
		2.80

Prices are per net ton, except east of Rochester and Kingston, Ont., where they are per gross ton.

Anthracite—The fall trade is setting in. The demand has increased in the city quite rapidly of late and all would be satisfactory to the dealer but for the development of unmistakable symptoms of shortage. Already the consumer is finding that deliveries are slow and is disturbed over the outlook. The appearance of premiums on independent anthracite here and there is ominous and there are predictions of \$10 coal here next winter.

Shipping agents are agreed that the coal coming in is not nearly as much as they need, but they do not predict any better supply. If the Eastern demand increases as it is doing here and Westward there will be a general shortage all through the country soon.

Shipments by Lake for the week were 79,400 tons, of which 35,600 tons cleared for Duluth and Superior, 13,100 tons for Chicago, 11,200 tons for Milwaukee, 3,400 tons for Manitowoc, 13,500 tons for Port Arthur and 2,600 tons for Ashland. Rates have advanced to \$1 for Chicago, 75¢ for Milwaukee and Manitowoc, but remain at 30¢ for leading Lake Superior ports.

Prices of anthracite remain at the fall circular, per gross ton, f.o.b. cars at Buffalo at \$5.85 for grate, \$6.10 for egg and stove, \$6.35 for chestnut, \$5 for pea and agreed prices for smaller sizes. An additional charge of 25¢ is made for delivery on board vessel.

CLEVELAND

Car shortage causing increased prices. Small supply Lake coal at loading ports. Pittsburgh and Youghiogheny coals practically out of open market.

The car shortage and the increased demand for spot shipments has boosted the prices on all grades of coal for this market. The car shortage has also practically eliminated straight Pittsburgh and Youghiogheny coals from the open market as operators in these fields are having a hard time taking care of their contracts. A large operator in the Pittsburgh district reported that fifteen of his mines were down on account of the shortage of cars.

Supplies of Lake coal at loading ports are so small that it is forcing boats to call at two and three ports in order to get a full cargo. These conditions naturally have their effect in this market, which depends on the surplus coal mined for its supply, as practically 60 per cent. of the local business is not contracted for.

It is the best opinion that prices at present are only showing the beginning of a raise that will continue on all grades until Dec. 1, when Lake season will be closed and the market will have to readjust itself to new conditions. At that time practically everything will be bought on a mine-run basis and prices should go lower with the additional tonnage thrown on the market.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8.....	\$2.30	\$2.20	\$2.15
Cambridge.....	2.30	2.20	2.15
Middle Dist.....	2.20	2.10	2.05
Hocking.....			
Youghiogheny.....	2.60	2.50	
Pittsburgh.....	2.60	2.50	
Pocahontas.....			No quotations made

COLUMBUS

Another advance in wholesale prices. Demand strong and car shortage increasing.

The wholesale price on all grades was advanced, effective about Sept. 15. The advance was brought about by the extraordinary demand and the growing car shortage. It amounts to from 15 to 25¢.

a ton and operators and jobbers state that even these prices are subject to change without notice. The tone of the market is satisfactory and prospects for the future are the brightest in years.

Domestic business is one of the strongest features of the trade. Dealers are buying liberally as their stocks are depleted because of heavy orders from consumers. Pocahontas is selling well and prices are generally firm. There is also a good demand for West Virginia splints. Red and White ash are moving in large quantities. Hocking lump is being stored and the same is still of Pomeroy Bend and Jackson products.

Steam business continues brisk in every respect. Factories making iron and steel products are good purchasers and the same is true of other lines of manufacturing. Fuel requirements of railroads are being increased. There is little available supply on the open market and as a result it is almost impossible for consumers to accumulate a surplus. The curtailment of production in West Virginia, coupled with the car shortage, is reducing available stocks of nut, pea and slack and coarse slack.

Lake trade is still strong although there has been a slight falling off on the tonnage shipped to the Northwest. There will be a shortage of more than 1,000,000 tons on the docks of the upper Lake ports. Dock prices remain firm and chartering of boats is a difficult matter.

The Hocking Valley Ry. is now short of equipment, the last of the roads to feel the pinch. Labor shortage is also having its effect.

Prices on short tons, f.o.b. mines, are as follows:

	Hock-	Pom-	East-
	ing	eroy	ern
Rescreened lump.....	\$2.00	\$2.15	
Inch and a quarter.....	1.85	1.95	\$1.75
Three-quarter inch.....	1.75	1.85	1.60
Nut.....	1.35	1.60	1.45
Egg.....	1.50	1.50	
Mine run.....	1.50	1.50	1.45
Nut, pea and slack.....	1.15	1.20	1.10
Coarse slack.....	1.05	1.10	1.00

DETROIT

Buying of steam coal moderately active. Little demand for domestic grades. Lake movement slower.

Bituminous—Users of steam coal are not buying in much greater quantities but the demand is steady and with the supply curtailed by suspension of mine operations in some districts, a firmer tone is developing which is being reflected in the greater stability of prices, with slight advances on some sizes. Nut, pea and slack retains first place in the volume of orders and quotations are uniformly on the basis of \$1.40 at the mines. West Virginia mine-run stands at \$1.50, mine price, with Cambridge and Pittsburgh No. 8, five cents cheaper and Hocking mine-run quoted \$1.35. Three-quarter lump from West Virginia or Hocking fields carries a price of \$1.60 at the mines while Pittsburgh No. 8 and Cambridge is \$1.50. Very little coal is reported on tracks and practically none remains long enough to be forced on the market at cut prices.

Anthracite—Household consumers are showing no haste to cover their winter requirements and in consequence retail dealers are facing a prospect of seeing their delivery facilities over-taxed, when the weather turns sufficiently cold to stimulate general buying. With distribution backward, retail dealers are delaying adding to their stocks. The difficulty which they have experienced in getting men to unload cars promptly, is also a factor in discouraging buying at this time.

Lake Trade—Scarcity of cars has greatly reduced the amount of coal moving to loading ports for Lake shipment. One large concern reported that 15 of its mines in the Pittsburgh district were closed by lack of cars. The slow movement to docks is causing many Lake vessels having contract coal to make their upbound trips without cargoes. Other vessels are filling out cargoes by loading at two ports.

The slowing down of the Lake coal trade is reflected in a less active demand for carrying capacity and the placing of some cargoes at rates closely approximating those under which contracts were closed early in the season. There is some demand for small vessels to move coal to minor ports on Lake Michigan and the rates paid represent a substantial advance over the early contract figures.

CINCINNATI

Demand active and prices much higher. Steam grades especially strong. Car supply increasingly short.

The limited production available for this market from West Virginia, due to the flood damage and short car supply has resulted in the strongest market of the season so far, and with the highest prices. Reports of sales of nut and slack as high as \$1.75 f.o.b. mines are received, with many sales at \$1.75 f.o.b. mines are received, with many sales

at \$1.75 f.o.b. mines are received, with many sales as high as \$1.75 f.o.b. mines are received, with many sales

their stocks are by no means what they should be. The labor situation in Cincinnati and other retail markets has made it difficult to get cars unloaded, and this has prevented the handling of as much coal as dealers would like to get.

LOUISVILLE

Car situation threatens famine. Local yards getting bare of coal. Operators not bidding on contracts now expiring.

Some of the Kentucky operators have been advising their customers that they will not submit bids for renewal of expiring contracts and that they cannot promise deliveries at the market. About a 40 per cent. car supply is the rule. Those operators who were well sold up cannot fill their contracts in full. A sharp fall in temperature the middle of the month, with frost, unusual in Kentucky, brought a quick demand from domestic consumers and many of the Louisville dealers report that their yards are bare. The low stage prevailing in the Ohio River makes shipments from the Pittsburgh district somewhat uncertain.

Eastern Kentucky mines are selling, f.o.b. mine, long-ton basis: Block, \$2.50; lump, \$2.25; egg, \$1.75; mine-run, \$1.50, and there are no reports of nut and slack selling below \$1.

Western Kentucky lump is in demand at \$1.35 and is expected to go to \$1.50, a new high mark; there is no nut and slack on the market.

BIRMINGHAM

Demand for all grades coal good. Prices firm. Car supply determining factor in production and movement.

The coal trade continues very active and more business is being offered in both steam and domestic grades than can be taken care of where early deliveries are specified, due to restricted production on account of scarcity of equipment. The recent advance in prices on both steam and domestic coal has not hindered the buying movement.

Production would doubtless reach the high-water mark if the car supply was anything like adequate to move the business booked and supply the current demand. Shortage of equipment is the subject of grave concern with the operators and the railroads express the opinion that no relief is in sight.

Coke

CONNELLSVILLE

Spot coke scarce. Heavy coal shipments for byproduct ovens. Interest in first-half contracts. Production and shipments decreased.

While the open market demand for spot coke appears to be extremely light there is reason to believe there is considerably more than appears on the surface, through consumers having gotten into the habit of having an operator or broker buy any spot coke that may be needed, the furnaces having observed that putting out general inquiries had a decided tendency to advance the market. The offerings of spot coke are very limited. Production is held steady by the shortage of labor and the large amount of coal being shipped from the region, chiefly for byproduct coking, these coal shipments now running 275,000 to 300,000 tons a week. The Connellsburg and lower Connellsburg regions are mining much more coal than ever before in their history, although the coke shipments are running at least 10% below the record.

Interest in first-half contracts for coke is increasing. There are rumors that a couple of contracts have been quietly closed, but no details are vouchsafed. The operators evidently expect to ask at least \$2.75. Furnaces have been finding a good market for pig iron, with prospects of prices advancing, and may shortly become anxious to cover on coke even though asked a higher price than was expected. We quote: Spot furnace, \$2.80@2.85; contract, nominal, \$2.50@2.75; spot foundry, \$3.25@3.30; contract, \$3.25@3.50, per net ton at ovens.

The "Courier" reports production in the Connellsburg and lower Connellsburg region in the week ended Sept. 9 at 384,374 tons, a decrease of 16,736 tons, and shipments at 384,213 tons, a decrease of 19,771 tons. The decreases were due to light labor supply on Labor Day and a slight car shortage resulting from preparations that had been made for the threatened railroad strike.

Buffalo—All prices are strong, with deliveries slow. Jobbers who are not regularly supplied are adopting the practice of asking prices of a long list of ovens, in case they are anxious for anything like prompt filling of orders. Prices remain very firm at \$5.25 for best 72-hr. Connellsburg foundry, \$5 for 48-hr. furnace, \$4.40 for high sulphur and \$4.25 for stock.

Chicago—Byproduct coke producers are mainly concerned in taking care of orders already accepted some time ago. Some shippers are over a month behind their orders, and efforts are chiefly put forth to get cars to fill orders already booked. Nominal prices per net ton f.o.b. cars Chicago are as follows: Connellsburg, \$6@6.25; Wise County, \$6@6.25; byproduct foundry, \$6@6.25; byproduct domestic, \$5@5.50; gas house, \$4.75@4.85.

Middle Western

GENERAL REVIEW

Domestic sizes show increased strength. Steam coals slightly easier. Anthracite demand strong with short supply. Smokeless very firm. Car supply short at all Western mines.

Indiana and Illinois domestic sizes have advanced 5¢ per ton this week. Steam sizes are slightly easier but mine-run is stronger. The strength of the domestic market is mainly due to the fact that retailers are placing heavy orders in an attempt to put their stocks on a normal basis now that colder weather is imminent. It is said that retail dealers throughout the West are sixty days behind their orders.

That this situation is going to create an enormous demand later, which cannot be supplied is plainly seen. The car situation at Indiana mines is becoming increasingly serious, and the Indiana Coal Trade Bureau has cautioned operators to use every effort to conserve car supply by loading cars to capacity, ordering properly, and advising against the use of equipment for storage purposes.

Screenings have averaged from 95¢ to \$1.10 per ton this week, as against 50¢ at this time last year. The cancellation of embargoes at the mines permitted considerable quantities of smokeless coal to come forward, but representatives of the smokeless operators in this section found little difficulty in disposing of the tonnage promptly.

All signs point an unprecedented all-rail movement to Northwestern territory this winter and these long hauls will further curtail the car supply. Coal is moving freely from the docks to Northwestern points, but the movement of the grain crops interferes somewhat with the car supply. It is now estimated that the shortage at the head of the Lakes by the end of the season will be well above a million tons.

Steam business is brisk, and large users are endeavoring to increase their orders. All iron and steel plants are operating on an overtime schedule, and many factories are still engaged on large munition contracts. Some steam users believing that it will be difficult to obtain shipment during the next few months are asking for unusually heavy requisitions on their current contracts. Country dealers have shown much the same disposition in ordering domestic sizes, and are urging their connections by wire and letter daily to get tonnage to them.

CHICAGO

Upward tendency apparent on all grades. Premiums asked for spot coal. Retailers placing heavy orders for storage.

It is understood the Franklin County operators will increase their prices Sept. 20 to the following basis:

Lump	\$2.00	No. 3 nut	\$1.50
Egg	2.00	No. 4 pea	1.25
No. 1 nut	2.00	Mine-run	1.45
No. 2 nut	1.75		

The production of Franklin County district is now averaging approximately 225,000 tons per week, which is nearly 25,000 tons more than last year at this season. Screenings are still very active from southern Illinois mines, although in spots coarse steam sizes have eased off somewhat. No domestic lump is on track unbilled, and surpluses of other sizes at the mines are negligible in quantity.

The short car supply has been a sore point to southern Illinois operators, and but little relief is promised by railroad traffic managers. A large amount of domestic tonnage has been shipped from Williamson County mines at around \$1.75@1.85 this week. The larger producers are sold up a week or ten days ahead, and the Williamson County operators are about to issue a new circular increasing prices in approximately the same ratio as in the Franklin County district. Saline County operators have been sold up on lump and egg for several days past, and will also increase their prices on Sept. 20.

Springfield mines are oversold heavily and are shipping a large amount of screenings to Kansas City at the new low rate recently introduced. Domestic sizes are very strong, with indications that \$2 will be asked for major coarse sizes before the end of the month.

The Indiana operators have nothing for sale for the remainder of this month on coarse sizes, some of them have withdrawn prices, and an advance in schedules is imminent. No unbilled coal of any size is on tracks at Indiana mines, and screenings have been sold at maximum figures.

The demand from the country for smokeless sizes is very strong, and, as expected, a considerable shortage exists among country dealers. The current price for mine-run is \$1.75 for spot coal, whereas the circular reads \$1.50. Very little free coal was available at the end of the week. Lump and egg have been sold easily at \$2.25 this week.

Best grade of Kentucky coals have sold above circular, and most of the mines where domestic sizes are made are filled up with orders for the balance of the month. Current quotations in this territory have averaged from \$2.25@2.40 this week for lump, and from \$1.75@2 for egg.

Anthracite ordering is heavy from city dealers as well as from the interior, but the supply is short. Most agencies here are considerably be-

hind their orders, although wholesale prices have not advanced. Fears are entertained that there may be further advances in the price of anthracite before the season is much older.

Quotations in the Chicago market are as follows, f.o.b. cars mines per net ton:

	Wilms. and Frank. Cos.	Spring- field	Sullivan County	Clinton	Green and Knox Cos.
Lump	\$1.85@2.00	\$1.75@1.85	\$1.65@1.75	\$1.65@1.85	\$1.70@1.90
Steam lump	1.55@1.60	1.35@1.40	1.25@1.35	1.35@1.50	1.40@1.50
1/4-in. lump			1.55@1.65		1.50@1.60
Egg	1.85@2.00	1.75@1.85	1.46@1.50	1.70@1.80	1.50@1.80
No. 3 nut	1.40@1.50	1.75@1.90	1.35@1.40	1.60@1.65	1.35@1.40
No. 1 washed	1.85@2.00				
No. 2 washed	1.65@1.75				
No. 1 nut	1.85@2.00				
No. 2 nut	1.65@1.75				
Mine-run	1.35@1.45	1.25@1.35	1.25@1.30	1.30@1.35	1.25@1.30
Screenings	95@1.10	95@1.10	90@.95	1.00@1.05	1.00@1.05
Kanawha splint lump, \$2@2.10.					

Wilms. and Frank. Cos. Spring-field Sullivan County Clinton Green and Knox Cos.

Lump \$1.75@2.00 \$2.00@2.40 \$2.00@2.25 \$1.90@2.15 \$1.75@1.90

1/4-in. lump 1.45@1.55 1.65@2.00 2.00@2.25 1.90@2.15 1.80@1.90

Egg 1.85 1.65@2.00 1.40@1.60 1.75@1.90 1.75@1.90

No. 1 nut 1.90@2.00 1.40@1.60 1.60@1.80

No. 2 nut 1.65@1.75 1.50 1.50@1.75 1.45@1.65 1.40@1.45

Screenings 95@1.10 1.10 1.00@1.05

Official Contracts

New York, N. Y.—Bids will be received at the United States Engineer's Office until noon, Sept. 28, for furnishing and trimming into United States dredges during the year ending Sept. 30, 10,000 tons of bituminous coal. Address United States Engineer's Office, Room 707 Army Bldg., 39 Whitehall St., New York, N. Y.

Buffalo, N. Y.—The authorities of the J. N. Adam Memorial Hospital at Perrysburg have rejected for the second time the bids for furnishing an annual coal supply as readvertised, using a modification of the specifications of the Buffalo water department. Bids were too few or informal. The amount to be bought is 3,000 tons bituminous.

New York, N. Y.—The Quartermaster Department will receive bids until 10 a.m., Oct. 6, for furnishing a six months' supply of bituminous coal, estimated at between 700 and 1,000 short tons per month, to be delivered and trimmed in bunkers of transports in New York Harbor. Deliveries are to begin Oct. 15. Address Depot Quartermaster, New York, N. Y.

Boston, Mass.—The city government is requesting bids on 17,500 tons of bituminous coal for delivery to various harbor institutions during the next six months. This is a second request for bids on this business, and proposals will be received until noon, Sept. 21.

Dayton, Ohio—M. J. Tierney, of Dayton, has been awarded the contract to furnish 1,200 tons of coal for the county infirmary, at \$2.85 per short ton on switch at the infirmary. Run-of-mine coal from Paragon, W. Va., will be furnished.

General Statistics

ANTHRACITE SHIPMENTS

The shipments of anthracite for the month of August amounted to 5,531,797 tons, as compared with 5,462,127 tons for the corresponding month in 1915 and 5,532,878 tons in July, 1916. The increase of about 100,000 tons in August over July was less than should have been made if production had been at the same rate in each month, for in August there were 27 possible working days, while in July there were but 25. The shipments in July were at the average rate of 217,280 tons per working day, and in August they were at the average rate of 204,880 tons, a decrease in the later month of 12,400 tons. At the same daily average rate in August as in July the shipments would have amounted to about 5,865,000 tons, or 335,000 tons more than actually recorded.

The total shipments for the 8 months ended with August, 1916, amounted to 44,386,340 tons, against 42,894,785 tons in 1915.

	Domestic Sizes			Total				
	August	1916	1915	Year	August	1915	1916	1915
Phila. & Reading	870,752	721,613	7,202,179	6,220,271	1,000,667	847,262	8,523,401	7,100,087
Lehigh Valley	900,904	913,913	6,990,399	7,518,806	1,026,074	1,029,721	7,882,686	8,354,180
Cen. R. of N. J.	489,410	494,841	3,872,342	4,137,282	595,053	613,721	4,674,573	5,010,562
D. L. & W. R. R.	770,608	714,047	5,813,272	5,007,228	875,131	859,368	6,826,773	5,970,751
Dela. & Hud. Co.	475,815	599,298	3,960,132	4,471,565	572,822	731,137	4,733,883	5,232,732
Pennsylvania	401,886	354,687	3,469,848	3,193,077	482,416	426,818	3,992,368	3,766,322
Erie R. R.	576,042	572,058	4,573,786	4,294,386	658,044	690,817	5,290,624	5,097,909
N. Y. O. & W.	159,284	120,751	1,173,767	1,193,528	184,708	131,987	1,328,146	1,327,797
Lehigh & N. E. R. R.	152,208	111,989	1,327,992	917,351	190,779	131,296	1,570,609	1,034,443
	4,796,909		38,383,717		5,585,694		44,623,063	
*Deduction	37,707		161,522		53,897		236,723	
Total	4,759,202	4,603,197	38,222,195	36,953,494	5,531,797	5,462,127	44,386,340	42,894,783

Coal on hand at Tidewater Shipping Ports, Aug. 31, 1916: 373,176 tons; July 31, 1916: 384,239 tons.

*Deduction: Tonnage reported by both C.R.R. of N.J. and L. & N.E.R.R.

COAL MOVEMENT

The following is a statement of carloads of bituminous coal and beehive coke that originated on 50 railroads in August, 1916, compiled from reports received by the Geological Survey, Department of the Interior, by noon, Sept. 15, 1916.

25 roads in eastern classification territory (including Ill.)

14 roads in southern classification territory.

11 roads in western classification territory.

COMPARATIVE FIGURES BASED ON REPORTS OF 50 ROADS FOR AUGUST, 1916

25 roads in eastern classification territory (including Ill.)

14 roads in southern classification territory.

11 roads in western classification territory.

August, July, August, 1916 1916 1915

Carloads of bituminous coal 451,611 400,716 400,043

Carloads of beehive coke (9 roads) 51,636 47,354 47,190

August, 1916, showed an increase in shipments of bituminous coal of 10 per cent. over August, 1915, and of 13 per cent. over July, 1916. The corresponding increases in beehive coke shipments were 9.5 per cent. and 9 per cent.

NORFOLK & WESTERN

The following is a statement of coal handled by the N. & W. Ry. during August and the preceding two months in short tons:

	June	July	August	1916	1915	1916	1915
	Coal	1915	1916	1915	1916	1916	1915
Tidewater	1,616,174	1,449,384	1,631,263				
Foreign	348,785	321,687	345,167				
Thacker	266,362	278,701	286,008				
Kenova	78,988	77,320	94,772				
Clinch Valley	121,801	121,372	121,148				
Miscellaneous	4,178	3,692	5,353				
Total N. & W. W.	2,436,288	2,252,156	2,483,711				
Wilm. & Pond Ck.	112,381	118,014	111,390				
Tug R. & Ky. R. R.	44,586	55,299	55,359				
Other roads	452,395	415,976	398,480				
Grand total	3,045,650	2,841,445	3,048,940				

Destination of shipments over this road for July and the first seven months of last year and this year were as follows, in short tons:

	Seven Months			1916
	Coal	1915	1916	
Tidewater	516,709	319,183	2,184,984	2,046,415
Foreign	552	3,976	16,688	37,237
Dom'tic	281,739	200,210	1,887,920	2,050,035
Coke				
Foreign	2,088,703	2,351,489	11,575,400	15,900,381
Domestic	73,434	148,404	501,592	1,183,802
Total	2,961,137	3,023,262	16,166,584	21,217,961

VIRGINIAN RY.

Gross shipments of coal over the Virginian Ry. for June amounted to 420,620 tons, which compares with 436,199 tons in May.

Total

1,570,609 1,034,443

8,523,401 7,100,087

7,882,686 8,354,180

5,010,562 5,970,751

4,674,573 5,232,732

6,826,773 5,970,751

4,733,883 5,232,732

3,992,368 3,766,322

5,290,624 5,097,909

1,328,146 1,327,797

COAL MOVEMENT

Fuel shipments over 13 leading Eastern carriers for June and 6 months of 1915-16 were as follows, in short tons:

Classes and Railroads

	June	1915	1916	6 Months	1915	1916
Anthracite:						
Baltimore & Ohio	79,766	93,138	606,594	771,467		
Buffalo, Rochester & Pittsburgh	11,317	13,222	88,360	93,211		
Buffalo & Susquehanna	339	435	3,388	3,348		
Chesapeake & Ohio	1,358	1,828	6,418	6,418		
Erie	795,496	755,474	4,328,660	4,841,129		
Huntingdon & Broad Top Mountain	43	143	176	402		
Pennsylvania	843,053	907,892	5,415,066	5,860,041		
Pittsburgh, Shawmut & Northern	1,103	944	6,778	6,211		
Virginian	310	934	829	2,087		
Western Maryland	29,486	30,526	165,712	170,544		
Total	1,762,271	1,804,536	10,621,931	11,754,858		
Bituminous:						
Baltimore & Ohio	3,051,305	3,064,754	14,781,587	17,460,663		
Buffalo, Rochester & Pittsburgh	589,213	697,789	3,399,304	4,583,093		
Buffalo & Susquehanna	65,367	131,142	461,914	730,365		
Chesapeake & Ohio	2,024,639	2,380,805	10,118,056	13,632,380		
Erie	500,852	472,350	2,961,705	4,365,607		
Huntingdon & Broad Top Mountain	69,625	68,837	453,660	562,217		
New York Central (Buffalo and east)	474,549	541,947	2,890,041	3,987,036		
Norfolk & Western	2,462,698	2,788,819	11,248,552	15,288,338		
Pennsylvania	3,664,703	3,744,647	20,187,354	24,269,137		
Pittsburgh, Shawmut & Northern	155,229	273,598	1,023,575	1,503,867		
Virginian	284,952	403,986	1,788,133	2,623,344		
Western Maryland	724,133	690,778	3,979,766	3,922,546		
Total	14,067,265	15,259,452	73,293,647	92,928,593		

MIDDLE WESTERN ROADS

The following is a comparative statement of coal handled by 17 principal Middle Western carriers for the month of May, and the first five months of 1915 and 1916:

	May	1915	1916	5 Months	1915	1916
Illinois Central	472,450	510,544	2,965,413	3,878,657		
C. & E. I. RR.	319,925	404,396	2,452,841	3,208,485		
C. B. & Q. RR.	272,709	360,867	2,096,612	2,660,793		
C. C. C. & St. L. RR.	307,598	325,626	2,031,589	2,326,200		
Vandalia RR.	343,055	349,309	2,048,155	2,257,021		
C. T. H. & S. E. Ry.	195,400	209,220	1,293,797	1,573,957		
C. & A. Ry.	119,661	132,178	770,624	1,084,433		
Wabash RR.	89,791	100,639	654,670	760,764		
St. L. I. M. & S. Ry.	96,173	94,227	584,576	623,442		
Southern Ry.	84,078	120,448	454,230	803,881		
B. O. S. & W. RR.	47,498	49,750	416,283	317,603		
St. L. T. & E. RR.	43,493	55,297	255,430	317,124		
St. L. & O. F. Ry.	38,296	36,487	254,398	290,469		
L. & M. Ry.	19,502	27,337	225,017	236,145		
C. L. & L. Ry.	58,042	55,682	251,884	310,629		
C. P. & St. L. Ry.	25,165	32,139	177,178	229,579		
C. & N. W. Ry.	26,986	24,841	173,901	245,244		

SAULT STE. MARIE CANAL

Coal shipments through the Sault Ste. Marie Canals for August and the 5 months of this year and last year, compare as follows:

	August	1915	1916	5 Mos.	1915	1916
Hard.	279,948	322,136	1,274,174	1,305,594		
Soft.	1,771,012	2,424,941	6,552,627	9,158,100		
Total.	2,050,960	2,747,077	7,826,801	10,463,694		

I. C. C. Decisions

No. 5650. Charles Becker, trading as Wisconsin Coal Co., vs. Pere Marquette R.R. No. 5650 (Sub-No. 1). Elmore Benjamin Coal Co. vs. same. Submitted Dec. 1, 1915. Decided May 31, 1916.

1. The "reasonable time" within which consignees should have given orders for reconsignment at Milwaukee or Ludington so as to have avoided the charge for reconsignment extends from the day on which (passing) notice was mailed until noon of the second day thereafter.

2. Reconsignment charges assessed between Dec. 18, 1912, and Feb. 9, 1913, should be refunded if orders for reconsignment were given prior to arrival of cars at Milwaukee or within the "reasonable time" prescribed.

3. Reconsignment charges assessed at Ludington between Feb. 9, 1913, and Apr. 10, 1914, should be refunded if carrier failed to furnish passing notice at Toledo, or if complainant had given reconsignment orders within the "reasonable time," or prior to the arrival of the car.

4. All demurrage assessed during period of controversy, Dec. 18, 1912, to Feb. 9, 1913, must be refunded.

5. Demurrage charges, lawfully accruing and assessed from Feb. 9, 1913, to Apr. 10, 1914, must stand.

6. Reconsignment charges at Milwaukee, subject to the finding as to "reasonable time," should be assessed between Oct. 17, 1912, and Dec. 17, 1912, inclusive.

No. 7747. Thorne, Neale & Co. vs. Wabash R.R. Submitted July 17, 1915. Decided June 5, 1916.

Complainant, by its agent, misbilled three carload shipments of coal from Plymouth Junction, Penn., to Sharon, Ill., in error for Peoria; complaint that the shipments had been misrouted by the defendants found to be without merit and dismissed.

Investigation and Suspension Docket No. 724. Coal and coke from Bon Air, Tenn., and other points. Submitted Apr. 17, 1916. Decided June 29, 1916.

Over the protest of the Southern Railway Co.,

Investigation and Suspension Dockets Nos. 629 and 840. Coal to Red Wing, Minn. Fourth Section Applications Nos. 2297 and 2874. Submitted Aug. 30, 1915. Decided July 10, 1916.

1. The Chicago, Milwaukee & St. Paul Railway Co. denied authority to maintain a rate on coal from Chicago and Milwaukee to Red Wing, Minn., lower than to intermediate points.

2. Chicago Great Western Railroad Co. authorized to establish a proportional rate from Chicago and points taking the same rates, on bituminous coal in carloads, when originating at points in Kentucky and West Virginia, to Red Wing, Minn., the same as the rate maintained by the Chicago, Milwaukee & St. Paul Railway Co. from Milwaukee to Red Wing, and to maintain higher rates at intermediate points between, but not including, Alta Vista, Iowa, and Red Wing.

3. Orders of suspension vacated.

Investigation and Suspension Docket No. 196. Advances on coal within Chicago switching district. Submitted Dec. 11, 1914. Decided July 12, 1916.

In the original report in this proceeding we held that the respondents had not justified proposed increased rates on coal and coke from mines in various states to points on the line of the Chicago, Milwaukee & St. Paul Ry. in Chicago, 27 I. C. C., 71. The carrier named performs only a terminal service in Chicago on this traffic. It now asks that we fix the division which it may receive out of the through rate; held, that upon the whole situation the Commission does not feel justified in ordering a basis of divisions different from that now existing.

Foreign Markets

GREAT BRITAIN

Sept. 6.—The scarcity of coal continues and values are still very high. It is expected that by the end of September the extraordinary demands will have been met and that things will revert to a more normal condition:

Best Welsh steam.	Nominal
Best seconds.	Nominal
Seconds.	\$1 28 ⁶ 11 52
Best dry coals.	10 20 ⁶ 10 80
Best Monmouthshires.	11 28 ⁶ 11 52
Seconds.	10 56 ⁶ 10 80
Best Cardiff smalls.	7 20 ⁶ 7 80
Cargo smalls.	5 40 ⁶ 6 00

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—On account of the paucity of chartering orders due to coal shortage, freights continue to drop:

Gibraltar.	86 24	Port Said.	\$13 20
Genoa.	14 40	Las Palmas.	6 60
Naples.	14 40	St. Vincent.	7 20
Alexandria.	13 80	River Plate.	7 50

Exports—British exports for July and the seven months of the past two years were as follows:

	June	1915	1916	1915	1916
To					
Russia.	10,152	3,114	29,572	4,804	
Sweden.	131,382	150,315	1,759,450	959,114	
Norway.	243,107	225,623	1,602,402	1,394,438	
Denmark.	373,192	195,420	1,910,432	1,399,502	
Netherlands.	179,653	101,532	941,862	680,109	
France.	1,533,713	1,481,826	9,994,471	9,962,833	
Portugal ¹ .	86,087	74,634	619,539	563,070	
Spain ² .	187,246	206,293	1,233,277	1,307,486	
Italy.	356,676	575,401	3,425,050	3,279,615	
Aus. Hun.	43,890	3,878	263,379	92,605	
Roumania.			6,557		
Turkey.	53,010	50,824	578,505	470,565	
Portugal ³ .	23,552	19,260	136,336	159,670	
Chile.	343	1,040	35,773	17,572	
Brazil.	18,632	2,199	359,902	166,291	
Uruguay.	7,022	3,115	211,114	155,642	
Argentina.	68,344	12,622	1,026,416	577,978	
Channel Is.	11,505	10,854	72,622	61,037	
Gibraltar.	12,260	42,206	202,326	293,522	
Malta.	13,061	5,471	99,337	56,869	
Egypt ⁴ .	118,177	104,101	803,973	460,495	
Aden ⁵ .	16,615	124	105,794	6,032	
India.	5,915	114	18,075	8,836	
Ceylon.	6,740		38,730	20,343	
Miscell.	38,843	34,151	396,813	300,945	
Coke.	66,935	137,385	486,644	881,632	
Briquettes.	125,880	132,635	750,755	817,614	

Total.... 3,731,932 3,574,137 27,109,106 24,078,824

Bunker.... 1,098,877 1,011,693 849,198 7,589,900

¹ Includes Azores and Madeira. ² Including Anglo-Egyptian Sudan. ³ And dependencies. ⁴ And Canaries. ⁵ West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

ITALY

Press reports from Rome under date of Sept. 10 are to the effect that the price of coal has recently advanced to \$50 per ton, in spite of the recent conferences of Anglo-Italian officials held with a view to effecting a reduction in fuel prices.